Grizzly Industrial, Inc.®

MODEL G9249
12" X 37" BELT DRIVE
GAP BED LATHE
OWNER'S MANUAL

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#TS10612 PRINTED IN CHINA

⚠ WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance and service of this machine/equipment.

Failure to read, understand and follow the instructions given in this manual may result in serious personal injury, including amputation, electrocution or death.

The owner of this machine/equipment is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, blade/cutter integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

⚠ WARNING!

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks, cement and other masonry products.**
- **Arsenic and chromium from chemically-treated lumber.**

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

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INTRODUCTION

Foreword

We are proud to offer the Model G9249 12" x 37" Belt Drive Gap Bed Lathe. This machine is part of a growing Grizzly family of fine metal-working machinery. When used according to the guidelines set forth in this manual, you can expect years of trouble-free, enjoyable operation and proof of Grizzly's commitment to customer satisfaction.

The specifications, drawings, and photographs illustrated in this manual represent the Model G9249 when the manual was prepared. However, owing to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly. For your convenience, we always keep current Grizzly manuals available on our website at **www.grizzly.com**. Any updates to your machine will be reflected in these manuals as soon as they are complete. Visit our site often to check for the latest updates to this manual!

Contact Info

We stand behind our machines. If you have any service questions, parts requests or general questions about the machine, please call or write us at the location listed below.

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Fax: (800) 438-5901
E-Mail: techsupport@grizzly.com

If you have any comments regarding this manual, please write to us at the address below:

Grizzly Industrial, Inc.
C/O Technical Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

Functional Overview

The metal lathe is used to remove material from a workpiece mounted on the rotating spindle. The spindle receives power from the electric motor through the gears and belts in the headstock.

Tools used for turning or threading the workpiece are mounted on the carriage or tailstock. The tooling is moved parallel or across the workpiece by moving the carriage or cross slide. The movement of these mechanisms is controlled manually by handwheels or automatically with the power feed.

Spindle speeds are selected by configuring the gears and belts in the headstock. Power feed rates of the carriage or cross slide are selected by configuring the change gears and feed rate selectors.

The usual cutting operations for this lathe include facing, turning, parting, drilling, reaming, grooving, knurling, and threading. There is a wide variety of tools and workpiece holding devices for each of these processes.

Identification

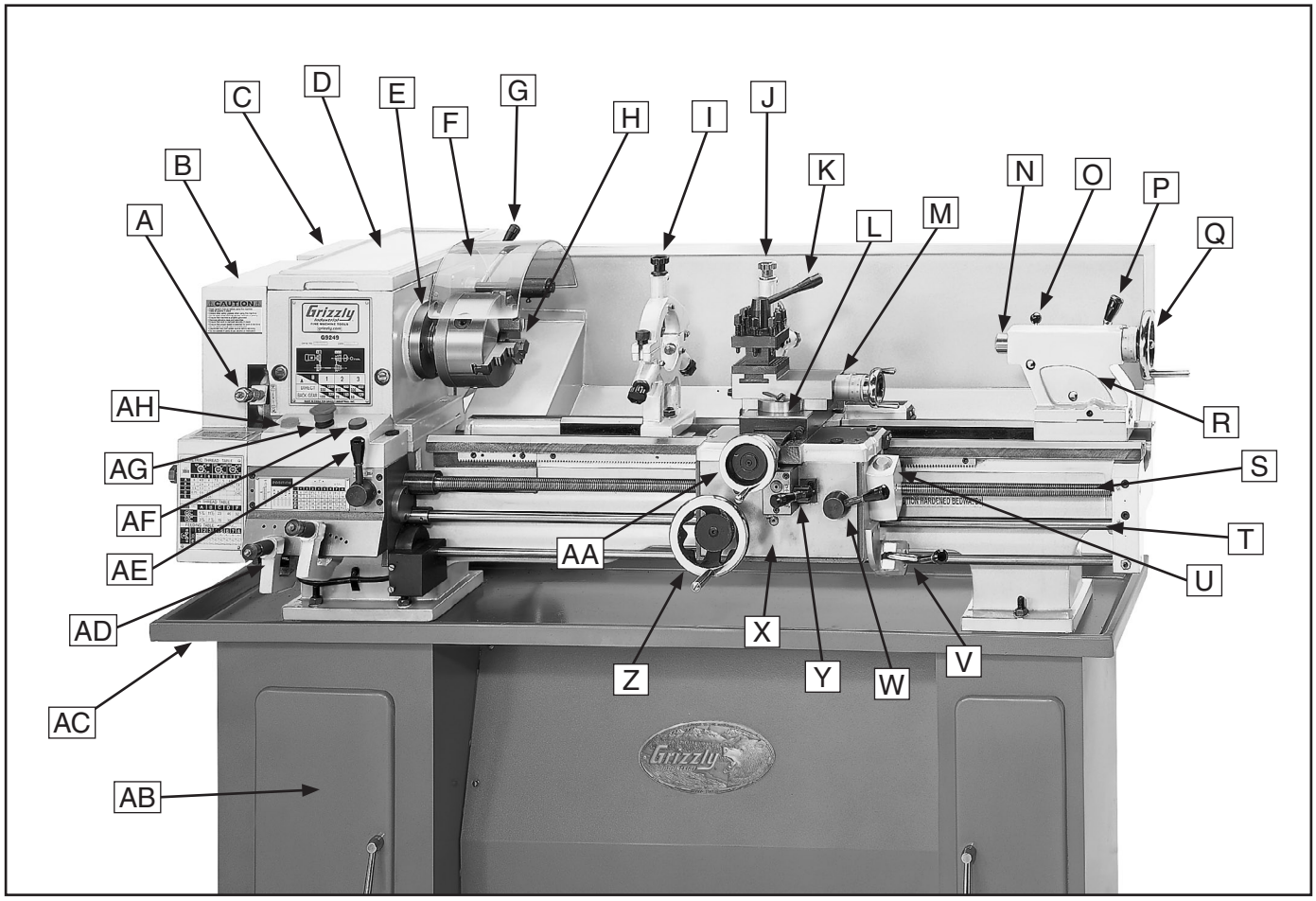


Figure 1. Model G9249 identification.

A. Feed Direction Lever
B. Change Gear Cabinet
C. Electrical Cabinet
D. Headstock Cover
E. Headstock Threaded Spindle 2¼"-8 MT#5
F. Chuck guard
G. Belt Tensioning Lever
H. 3-Jaw Chuck
I. Steady Rest
J. Follow Rest
K. 4-Way Tool Post
L. Cross Slide
M. Compound Slide
N. Tailstock Quill MT#3
O. Quill Lock
P. Tailstock Lock
Q. Quill Handwheel
R. Tailstock
S. Longitudinal Leadscrew
T. Feed Rod
U. Thread Dial
V. Spindle Direction Lever
W. Half-Nut Lever
X. Apron
Y. Feed Change Lever
Z. Carriage Handwheel & Dial
AA. Cross Slide Handwheel & Dial
AB. Cabinet Stand
AC. Chip Pan
AD. Feed Rate Selectors
AE. Feed Rod/Leadscrew Lever
AF. Jog Button
AG. Emergency Stop Button
AH. Power Lamp

MACHINE DATA SHEET

Customer Service #: (570) 546-9663 · To Order Call: (800) 523-4777 · Fax #: (800) 438-5901

MODEL G9249 12" X 37" BELT DRIVE GAP BED LATHE

Product Dimensions:

Weight..... 1136 lbs.
Length/Width/Height..... 64 x 27 x 49 in.
Foot Print (Length/Width)..... 57 x 14 in.

Shipping Dimensions:

Carton #1

Type..... Wood Crate
Content..... Machine
Weight..... 1024 lbs.
Length/Width/Height..... 71 x 29 x 29 in.

Carton #2

Type..... Cardboard
Content..... Left Stand
Weight..... 76 lbs.
Length/Width/Height..... 27 x 18 x 14 in.

Carton #3

Type..... Cardboard
Content..... Right Stand
Weight..... 58 lbs.
Length/Width/Height..... 27 x 15 x 11 in.

Electrical:

Switch..... Magnetic Switch with Thermal Overload Protection
Switch Voltage..... 220V
Recommended Breaker Size..... 10 amp
Plug..... No

Motors:

Main

Type..... TEFC Capacitor Start Induction
Horsepower..... 2 HP
Voltage..... 220V
Prewired..... 220V
Phase..... Single
Amps..... 7.5A
Speed..... 1725 RPM
Cycle..... 60 Hz
Number Of Speeds..... 1
Power Transfer ..... Belt Drive
Bearings..... Shielded and Permanently Lubricated

Main Specifications:

Operation Info

Swing Over Bed	12 in.
Dist Between Centers	37 in.
Swing Over Cross Slide	6-3/4 in.
Swing Over Saddle	6-1/2 in.
Swing Over Gap	18-7/8 in.
Max Tool Bit Size	5/8 in.
Compound Travel	3-1/2 in.
Carriage Travel	31-1/2 in.
Cross Slide Travel	6 in.

Headstock Info

Spindle Bore	1-7/16 in.
Spindle Size	2-1/4 in.
Spindle Taper	MT#5
Spindle Threads	8
No Of Spindle Speeds	12
Range Of Spindle Speeds	50 - 1200 RPM
Spindle Type	Threaded
Spindle Bearings	Tapered Roller

Tailstock Info

Tailstock Travel	3 in.
Tailstock Taper	MT#3
Tailstock Barrel Diameter	1-1/4 in.

Threading Info

No Of Inch Threads	50
Range Of Inch Threads	4 - 112 TPI
Range Of Longitudinal Feeds	0.0047 - 0.0165 in.
No Of Longitudinal Feeds	16
No Of Cross Feeds	16
Range Of Cross Feeds	0.0023 - 0.0082 in./rev.
No Of Metric Threads	24
Range Of Metric Threads	0.25 - 7.5 mm

Dimensions

Bed Width	7-1/8 in.
Leadscrew TPI	8
Leadscrew Length	45 in.
Faceplate Size	10 in.
Leadscrew Diameter	7/8 in.
Feed Rod Diameter	3/4 in.
Floor To Center Height	44-1/2 in.

Construction

Base Construction	Cast Iron
Headstock Construction	Cast Iron
Headstock Gears Construction	Cast Iron
Bed Construction	Induction Hardened Cast Iron
Body Construction	Cast Iron
Stand Construction	Formed Steel
Paint	Epoxy

Other

Kilowatt Output	1.119

Other Specifications:

Country Of Origin ..... China
Warranty ..... 1 Year
Serial Number Location ..... Front Center Headstock

Features:

Carriage Mounted On/Off Control Lever
Chip Tray
Chuck Safety Guard
Full Length Splash Guard
Heavy Duty Stand
Helical Back Gears
Inch/Metric Dials
Micro Switches Shut Off Machine When Side Door or Top Lid are Opened
Precision Hardened and Ground V-Bed
Threading Dial
Uses Tooth Belt to Reduce Vibration and Noise

Accessories Included:

10" Face Plate
4 Way Tool Post
6" 3-Jaw Chuck
8" 4-Jaw Chuck
Center Sleeve
Centers
Follow Rest
Manual
Metric Threading Change Gears
Rocker Style Tool Post
Service Tools
Steady Rest
Toolbox

SECTION 1: SAFETY

⚠WARNING

For Your Own Safety, Read Instruction Manual Before Operating this Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures.

⚠DANGER **Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.**

⚠WARNING **Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.**

⚠CAUTION **Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.**

NOTICE **This symbol is used to alert the user to useful information about proper operation of the machine.**

⚠WARNING

Safety Instructions for Machinery

1. **READ THE ENTIRE MANUAL BEFORE STARTING MACHINERY.** Machinery presents serious injury hazards to untrained users.
2. **ALWAYS USE ANSI APPROVED SAFETY GLASSES WHEN OPERATING MACHINERY.** Everyday eyeglasses only have impact resistant lenses—they are NOT safety glasses.
3. **ALWAYS WEAR A NIOSH APPROVED RESPIRATOR WHEN OPERATING MACHINERY THAT PRODUCES DUST.** Most types of dust (wood, metal, etc.) can cause severe respiratory illnesses.
4. **ALWAYS USE HEARING PROTECTION WHEN OPERATING MACHINERY.** Machinery noise can cause permanent hearing loss.
5. **WEAR PROPER APPAREL.** DO NOT wear loose clothing, gloves, neckties, rings, or jewelry that can catch in moving parts. Wear protective hair covering to contain long hair and wear non-slip footwear.
6. **NEVER OPERATE MACHINERY WHEN TIRED OR UNDER THE INFLUENCE OF DRUGS OR ALCOHOL.** Be mentally alert at all times when running machinery.

⚠WARNING
Safety Instructions for Machinery

7. **ONLY ALLOW TRAINED AND PROPERLY SUPERVISED PERSONNEL TO OPERATE MACHINERY.** Make sure operation instructions are safe and clearly understood.

8. **KEEP CHILDREN AND VISITORS AWAY.** Keep all children and visitors a safe distance from the work area.

9. **MAKE WORKSHOP CHILDPROOF.** Use padlocks, master switches, and remove start switch keys.

10. **NEVER LEAVE WHEN MACHINE IS RUNNING.** Turn power ***OFF*** and allow all moving parts to come to a complete stop before leaving machine unattended.

11. **DO NOT USE IN DANGEROUS ENVIRONMENTS.** DO NOT use machinery in damp, wet locations, or where any flammable or noxious fumes may exist.

12. **KEEP WORK AREA CLEAN AND WELL LIGHTED.** Clutter and dark shadows may cause accidents.

13. **USE A GROUNDED EXTENSION CORD RATED FOR THE MACHINE AMPERAGE.** Grounded cords minimize shock hazards. Undersized cords create excessive heat. Always replace damaged extension cords.

14. **ALWAYS DISCONNECT FROM POWER SOURCE BEFORE SERVICING MACHINERY**. Make sure switch is in OFF position before reconnecting.

15. **MAINTAIN MACHINERY WITH CARE.** Keep blades sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

16. **MAKE SURE GUARDS ARE IN PLACE AND WORK CORRECTLY BEFORE USING MACHINERY.**

17. **REMOVE ADJUSTING KEYS AND WRENCHES.** Make a habit of checking for keys and adjusting wrenches before turning machinery ***ON***.

18. **CHECK FOR DAMAGED PARTS BEFORE USING MACHINERY.** Check for binding or misaligned parts, broken parts, loose bolts, and any other conditions that may impair machine operation. Repair or replace damaged parts before operation.

19. **USE RECOMMENDED ACCESSORIES.** Refer to the instruction manual for recommended accessories. Improper accessories increase risk of injury.

20. **DO NOT FORCE MACHINERY.** Work at the speed for which the machine or accessory was designed.

21. **SECURE WORKPIECE.** Use clamps or a vise to hold the workpiece when practical. A secured workpiece protects your hands and frees both hands to operate the machine.

22. **DO NOT OVERREACH.** Maintain stability and balance at all times.

23. **MANY MACHINES CAN EJECT WORKPIECES TOWARD OPERATOR.** Know and avoid conditions that cause the workpiece to "kickback."

24. **ALWAYS LOCK MOBILE BASES (IF USED) BEFORE OPERATING MACHINERY**.

25. **CERTAIN DUST MAY BE HAZARDOUS** to the respiratory systems of people and animals, especially fine dust. Be aware of the type of dust you are exposed to and always wear a respirator designed to filter that type of dust.

⚠WARNING
Additional Safety Instructions for Metal Lathes

1. **UNDERSTANDING CONTROLS.** For efficient and safe use of this machine, make sure you understand the use and operation of all controls.

2. **SAFETY ACCESSORIES.** To reduce the risk of injury from flying chips, always keep the chuck guard in place over the spindle in addition to wearing safety glasses or a face shield when cutting.

3. **TOOL SELECTION.** Tool breakage is a potential hazard to the operator and is an avoidable expense. Always use the proper tooling for the operation. Make sure the tooling is sharp and held firmly in place with the proper device.

4. **CHUCK KEY.** The chuck key could cause serious personal injury if thrown from the spinning chuck. Never leave the chuck key in the chuck.

5. **SPINDLE SPEED.** Select the correct speed for the type of work, material, and tooling. Allow the lathe to reach full speed before beginning the cut. Turn the lathe ***OFF*** and allow the spindle to come to a complete stop by itself before changing gears, speeds, or direction. NEVER attempt to slow the spindle with your hands or a tool.

6. **CHANGING CHUCKS.** Lathe chucks are heavy and awkward to handle, and a falling chuck can cause serious injury and property damage. Get assistance and protect the bedway with a board or chuck cradle when removing or installing chucks.

7. **LATHE WORKING CONDITIONS.** Protect yourself and your investment—maintain your lathe in proper working condition. Never operate the lathe with damaged or worn parts. Perform routine inspections and maintenance promptly when scheduled or as needed.

8. **MOUNTING WORKPIECE.** Make sure the workpiece is properly mounted before starting the lathe. A workpiece thrown from the machine may severely injure you or a bystander.

9. **SAFETY CLEARANCES.** Make sure the workpiece has adequate clearance on all sides before starting machine. Check clearances for the tooling and tool holders, and all parts of the carriage before starting the lathe.

10. **LEAVING LATHE.** Always turn the lathe ***OFF*** before leaving it unattended. An unsupervised lathe that is running invites accidents.

11. **SUPPORT LONG STOCK.** Unsupported long stock mounted on the lathe will begin to whip when the spindle is turned ***ON***. Always properly support long stock and use a slow spindle speed when cutting.

12. **POWER FEEDS.** Always release power feeds after completing the job. Power feeds left engaged can cause a "crash" when lathe is turned ***ON***.

13. **MAINTENANCE PROCEDURES.** Make sure lathe is turned ***OFF***, disconnected from power, and all moving parts have come to a complete stop before starting any inspection, adjustment, or maintenance.

14. **AVOIDING ENTANGLEMENT.** DO NOT wear loose clothing, gloves, or jewelry when operating lathe. Tie back long hair and roll up sleeves.

15. **EXPERIENCING DIFFICULTIES.** If at any time you are experiencing difficulties performing the intended operation, stop using the machine! Contact our Technical Support at (570) 546-9663.

SECTION 2: CIRCUIT REQUIREMENTS

220V Operation

⚠WARNING

Serious personal injury could occur if you connect the machine to power before completing the setup process. DO NOT connect the machine to the power until instructed later in this manual.

⚠WARNING

Electrocution or fire could result if machine is not grounded and installed in compliance with electrical codes. Compliance MUST be verified by a qualified electrician!

Full Load Amperage Draw

This machine draws the following amps under maximum load:

Amp Draw..... 7.5 Amps

Power Supply Circuit Requirements

You MUST connect your machine to a grounded circuit that is rated for the amperage given below. Never replace a circuit breaker on an existing circuit with one of higher amperage without consulting a qualified electrician to ensure compliance with wiring codes. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**

Minimum Circuit Size..... 15 Amps

Minimum Cord Requirements

For 220V connection, use a stranded-copper flexible cord that meets the minimum requirements listed below, does not exceed 50 ft., and has an insulation type that starts with "S." A qualified electrician MUST determine the best cord to use in your environment depending on exposure to moisture, heat, and oils.

Cord Requirements ..... 14/3 AWG, 300VAC

Power Connection Device

The type of plug required to connect your machine to power depends on the type of service you currently have or plan to install. We recommend using the plug shown in **Figure 2**.

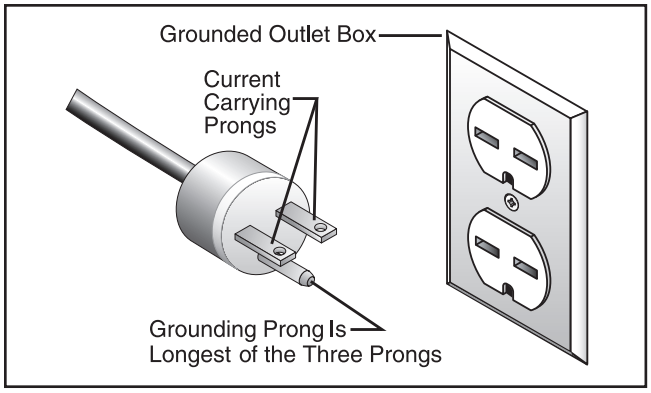


Figure 2. NEMA 6-15 plug and receptacle.

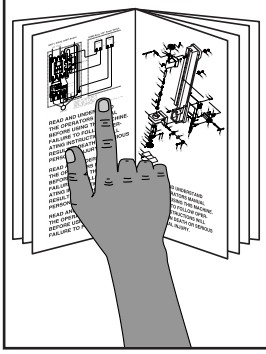
Extension Cords

Using extension cords may reduce the life of the motor. Instead, place the machine near a power source. If you must use an extension cord:

- Use at least a 14 gauge cord that does not exceed 50 feet in length!
- The extension cord must also have a ground wire and plug pin.
- A qualified electrician MUST size cords over 50 feet long to prevent motor damage.

SECTION 3: SETUP

Setup Safety

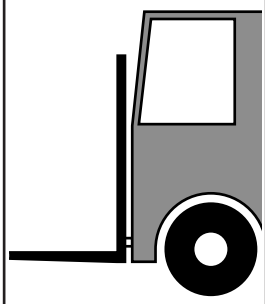


⚠WARNING

This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!

⚠WARNING

Wear safety glasses during the entire setup process!



⚠WARNING

The Model G9249 is a heavy machine. Serious personal injury may occur if safe moving methods are not used. To be safe, get assistance and use power equipment to move the shipping crate and remove the lathe from the crate.

⚠WARNING

Like all machinery there is potential danger when operating this machine. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this machine with respect and caution to lessen the possibility of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.

Items Needed for Setup

The following items are needed to complete the setup process, but are not included with your machine:

Description	Qty
• Machinist's Precision Level	1
• Assistants	At Least 2
• Safety Glasses	1 for Each Person
• Lifting Straps (rated for at least 1500 lbs.)	As Needed
• Power Lifting Equipment (rated for at least 1500 lbs.)	As Needed
• Floor Mounting Hardware	As Needed
• Lubrication	As Needed

Unpacking

Your machine was carefully packaged for safe transportation. Remove the packaging materials from around your machine and inspect it. If you discover the machine is damaged, *please immediately call Customer Service at (570) 546-9663 for advice.*

Save the containers and all packing materials for possible inspection by the carrier or its agent. *Otherwise, filing a freight claim can be difficult.*

When you are completely satisfied with the condition of your shipment, inventory the contents.

Inventory

The following is a description of the main components shipped with your machine. Lay the components out to inventory them.

Note: *If you can't find an item on this list, check the mounting location on the machine or examine the packaging materials carefully. Occasionally we pre-install certain components for shipping purposes.*

Box 1 Inventory: (Figure 3) **Qty**

A. 12" x 37" Lathe w/3-Jaw Chuck 6", Steady Rest, and Follow Rest Installed (not shown) 1
B. Rubber Gaskets (Lathe/Stand) 2
C. Brackets (Center Panel) 2
D. Complete Bolt Bag 1
— Hex Bolts M12-1.75 x 50 (Lathe/Stand) .. 6
— Lock Washers 12mm (Lathe/Stand) 6
— Flat Washers 12mm (Lathe/Stand) 6
— Hex Nuts M12-1.75 (Lathe/Stand) 6
— Phillips Head Screws M6-1 x 10 (Center Panel) 12
— Flat Washers 6mm (Center Panel) 12
— Hex Nuts M6-1 (Center Panel) 6
E. Center Panel 1
F. Chip Pan 1
G. Tool Box 1
H. American Rocker Type Tool Post 1
I. Oil Can 1
J. Drill Chuck Arbor MT#3–B16 1
K. Live Center MT#3 1
L. Spindle Sleeve MT#3–MT#5 1
M. Dead Centers MT#3 2
N. Hex Wrench Set 3, 4, 5, 6, 8mm ..... 1 Each
O. 4-Way Tool Post Key 1
P. Drill Chuck B16 & Key 1
Q. Outside Jaws for 3-Jaw Chuck 3
R. Standard Screwdriver #2 1
S. Handles 2
T. Change Gears 30, 32, 46T ..... 1 Each
U. Open End Wrench 13/16mm 1
V. 4-Jaw Chuck 8" 1
W. Faceplate 12" 1
X. Chuck Keys 2

If any nonproprietary parts are missing (e.g. a nut or a washer), we will gladly replace them; or for the sake of expediency, replacements can be obtained at your local hardware store.

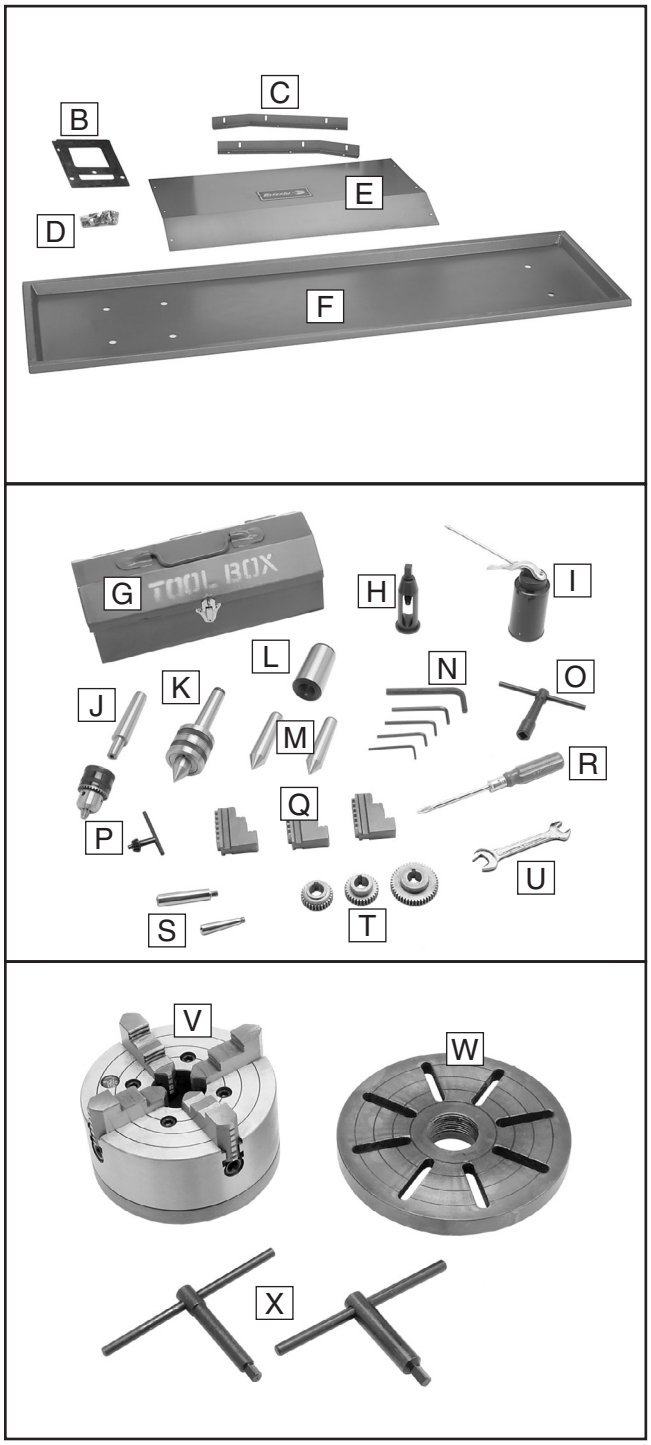


Figure 3. Box 1 inventory.

Box 2 Inventory: (Figure 4) **Qty**
Y. Left Cabinet Stand 1

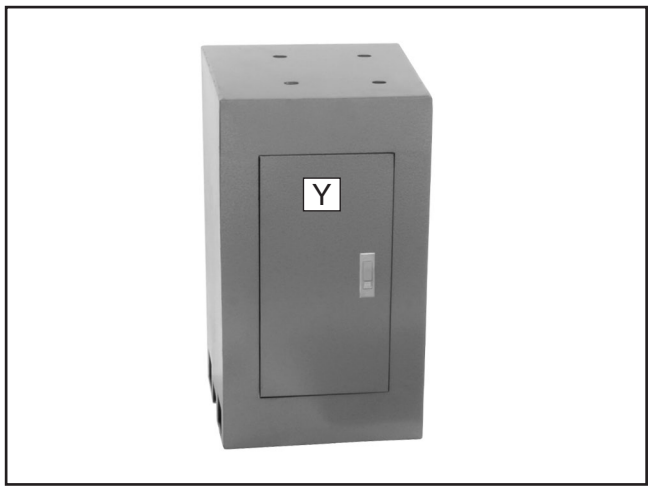
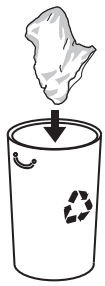


Figure 4. Box 2 inventory.

Box 3 Inventory: (Figure 5) **Qty**
Z. Right Cabinet Stand 1

Figure 5. Box 3 inventory.



⚠WARNING

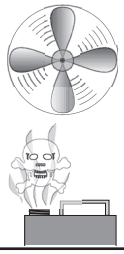
SUFFOCATION HAZARD!
Immediately discard all plastic bags and packing materials to eliminate choking/suffocation hazards for children and animals.

Clean Up

The unpainted surfaces are coated with a waxy oil to prevent corrosion during shipment. Remove this protective coating with a solvent cleaner or degreaser shown in **Figure 6**. For thorough cleaning, some parts must be removed. **For optimum performance from your machine, clean all moving parts or sliding contact surfaces.** Avoid chlorine-based solvents, such as acetone or brake parts cleaner that may damage painted surfaces. Always follow the manufacturer's instructions when using any type of cleaning product.

⚠WARNING

Gasoline and petroleum products have low flash points and can explode or cause fire if used to clean machinery. DO NOT use these products to clean the machinery.



⚠CAUTION

Many cleaning solvents are toxic if inhaled. Minimize your risk by only using these products in a well ventilated area.

G2544—Solvent Cleaner & Degreaser
A great product for removing the waxy shipping grease from your machine during clean up.

Figure 6. Cleaner/degreaser available from Grizzly.

Site Considerations

Floor Load

Refer to the **Machine Data Sheet** on **Page 4** for the weight and footprint specifications of your machine. Some residential floors may require additional reinforcement to support both the machine and operator.

Placement Location

Consider existing and anticipated needs, size of material to be processed through each machine, and space for auxiliary stands, work tables or other machinery when establishing a location for your new machine. See **Figure 7** for the minimum working clearances.

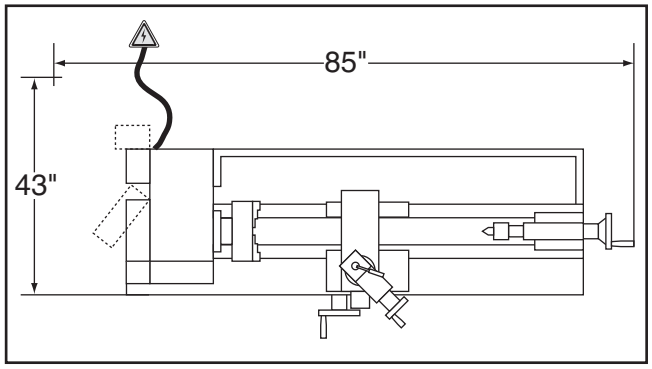
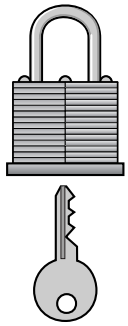


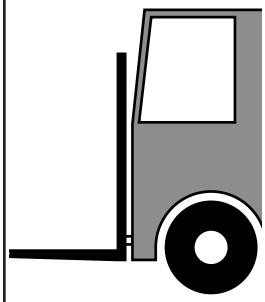
Figure 7. Model G9249 working clearances.



CAUTION

Children and visitors may be seriously injured if unsupervised around this machine. Lock entrances to the shop or disable start switch or power connection to prevent unsupervised use.

Lathe Assembly & Placement



WARNING

The Model G9249 is a heavy machine. Serious personal injury may occur if safe moving methods are not used. Get assistance and use power equipment (rated for at least 1500 lbs.) to move the shipping crate and remove the machine from the crate.

To assemble and move the lathe:

1. Place the cabinets at the prepared site for the lathe.

2. Attach the center panel brackets to the inside of the cabinets with six M6-1 x Phillips head screws and flat washers, as shown in **Figure 8**.

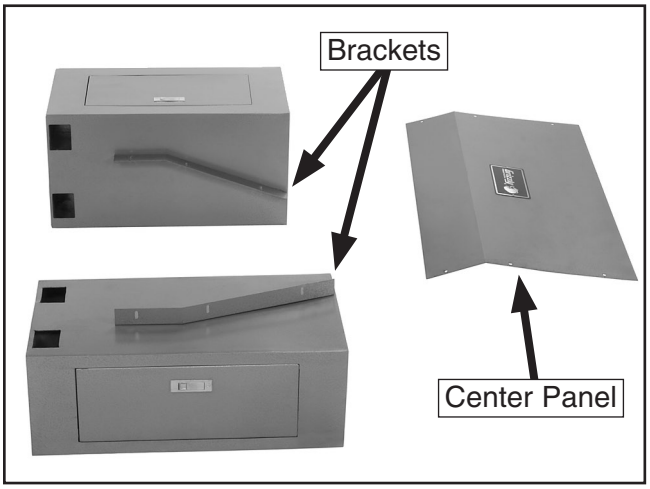


Figure 8. Center panel brackets installed.

3. Stand the cabinets upright, then attach the center panel to the brackets with the remaining M6-1 x 10 Phillips head screws, flat washers, and M6-1 hex nuts.

4. Position the chip pan on top of the cabinet stand. Line up the holes in the pan with the holes in the cabinets (see **Figure 9**).

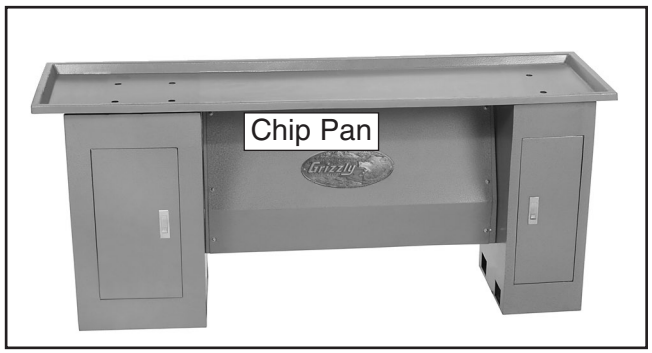


Figure 9. Chip pan in the correct position.

5. Position the rubber gaskets on the chip pan so that the holes line up with those in the pan.

   Note: *We recommend using a silicone RTV sealant between the gaskets and the chip pan to avoid leaking lubricants and coolants into the cabinets.*

6. Loosen the carriage lock bolt shown in **Figure 10**, then move the carriage to the far right of the bedway to balance the weight evenly along the length of the lathe.

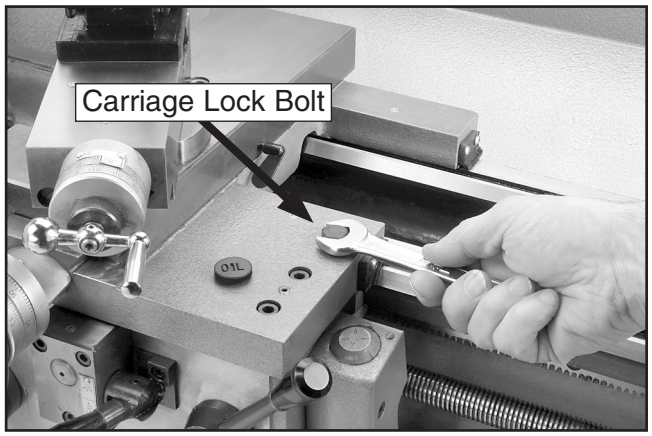


Figure 10. Loosening the carriage lock bolt.

⚠WARNING

Only use lifting straps and power lifting equipment rated for at least 1500 lbs. and in good working condition. If the lathe falls or tips over while moving it, serious personal injury and property damage could result.

7. Prevent damage to the leadscrew, feed rod, and the spindle direction rod by threading the lifting straps between the bedway and the rods, as shown in **Figure 11**.

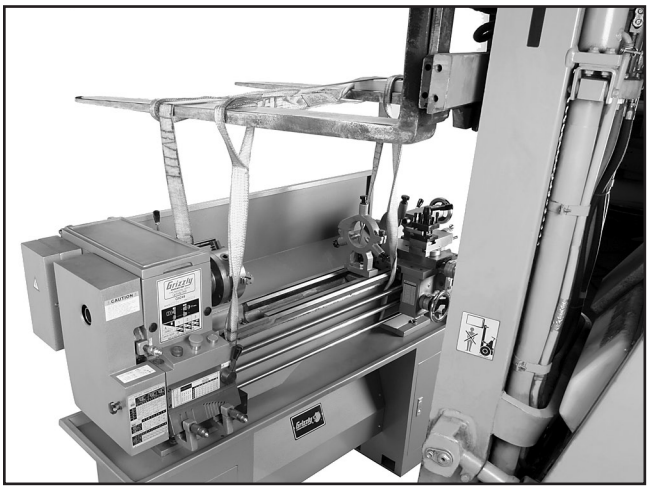


Figure 11. Lifting the lathe on the cabinet stand assembly.

8. With assistance, carefully lift the lathe over the cabinet stand and align the mounting holes in the lathe base with the holes in the chip pan.

9. Secure the lathe to the cabinet stand with the six M12-.175 x 50 hex bolts, lock washers, flat washers, and M12-1.75 hex nuts.

   Note: *Reach into the cabinets to install the lock washers, flat washers, and hex nuts.*

10. Install the handles on the cross slide and carriage handwheels, as shown in **Figure 12**.

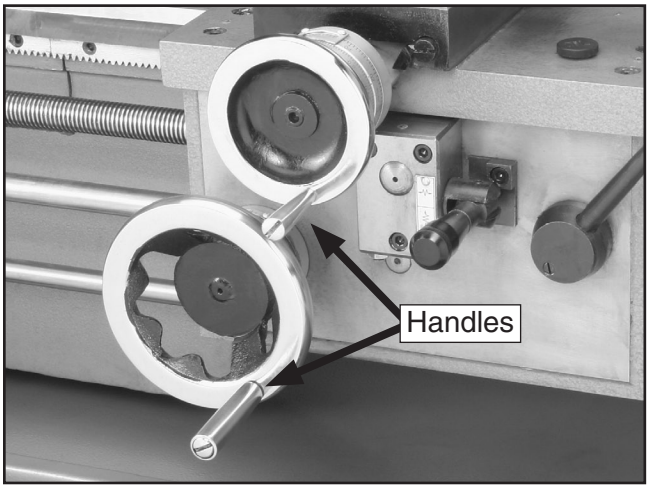


Figure 12. Handwheel handles installed.

11. Review the information in the following subsection, **Mounting to Shop Floor**, and select a mounting method.

12. To ensure accurate results from your lathe, use a machinist's precision level to make the lathe bedway exactly level from side-to-side and from front-to-back. If necessary, use shims between the cabinets and floor.

    Note: *Re-check the bedway after 24 hours, after two weeks, then annually to make sure it remains level.*

Mounting to Shop Floor

Although not required, we recommend that you mount your new machine to the floor. Because this is an optional step and floor materials may vary, floor mounting hardware is not included. Generally, you can either bolt your machine to the floor or mount it on machine mounts. Both options are described below. Whichever option you choose, it is necessary to level your machine with a precision level.

Bolting to Concrete Floors

Lag shield anchors with lag bolts and anchor studs (**Figure 13**) are two popular methods for anchoring an object to a concrete floor. We suggest you research the many options and methods for mounting your machine and choose the best that fits your specific application.

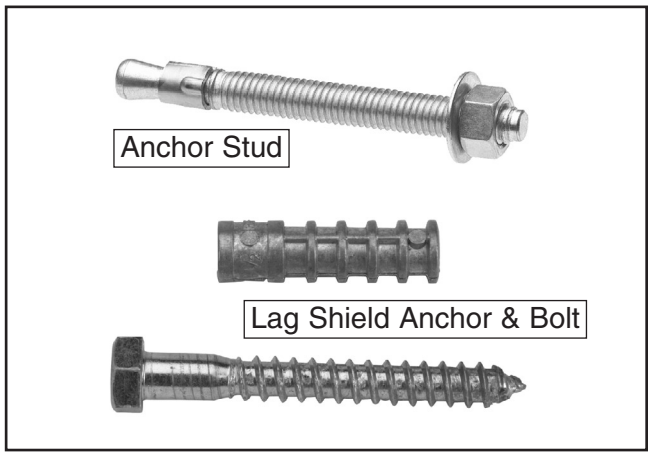


Figure 13. Typical fasteners for mounting to concrete floors.

NOTICE

Anchor studs are stronger and more permanent alternatives to lag shield anchors; however, they will stick out of the floor, which may cause a tripping hazard if you decide to move your machine.

Using Machine Mounts

Using machine mounts, shown in **Figure 14**, gives the advantage of fast leveling and vibration reduction. The large size of the foot pads distributes the weight of the machine to reduce strain on the floor.

Figure 14. Machine mount example.

NOTICE

We strongly recommend securing your machine to the floor if it is hardwired to the power source. Consult with your electrician to ensure compliance with local codes.

NOTICE

The gap is installed, then ground at the factory during lathe assembly for precise fit and alignment. Factors during the assembly apply additional forces to the gap, making replacing the gap to the original position very difficult. If you choose to remove the gap, we DO NOT recommend replacing it.

Check Gearbox Oil

It is critical that you make sure there is oil in the headstock and apron before proceeding with the test run. Refer to **Lubrication** beginning on **Page 47** for detailed instructions.

Test Run

Once the assembly is complete, test run your machine to make sure it runs properly and is ready for regular operation. The test run consists of verifying the following: 1) The motor powers up and runs correctly and 2) the safety features works correctly.

If, during the test run, you cannot easily locate the source of an unusual noise or vibration, stop using the machine immediately, then review **Troubleshooting** on **Page 53**.

If you cannot find a remedy, contact our Tech Support at (570) 546-9663 for assistance.

⚠WARNING

Before starting the lathe, make sure you have performed the preceding assembly and adjustment instructions, and you have read through the rest of the manual and are familiar with the various functions and safety features on this machine. Failure to follow this warning could result in serious personal injury or even death!

To test run the machine:

1. Make sure you understand the safety instructions at the beginning of the manual and that the machine is setup properly.

2. Perform all lubrication procedures in the **Lubrication** subsection on **Page 47**.

3. Make sure the 3-jaw chuck is firmly mounted on the spindle. Check the clamps on the back of the chuck, as shown in **Figure 15** (refer to **Chuck & Faceplate Mounting/Removal** on **Page 22** for detailed instructions).

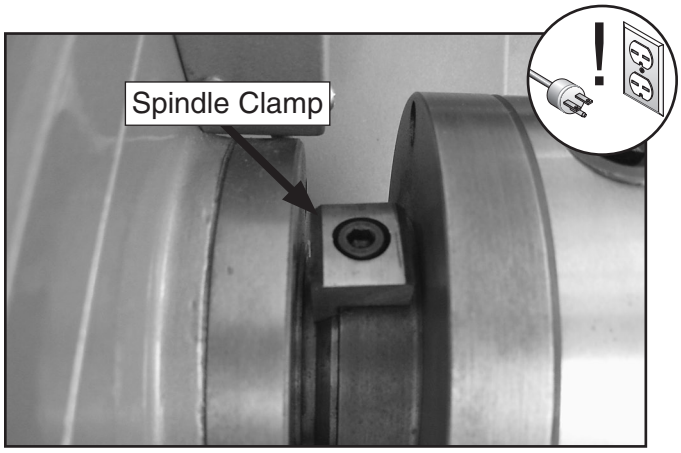


Figure 15. Spindle clamp.

4. Make sure all tools and objects used during setup are cleared away from the machine.

5. Move the feed rod/leadscrew lever to the neutral (center) position (see **Figure 16**). This will prevent the carriage from moving during testing.

Figure 16. Feed rod/leadscrew lever in center (neutral) position.

6. Connect the machine to the power source.

7. Push the emergency stop button in, then twist it clockwise so it pops out. When the emergency stop button pops out, the switch is reset and ready for operation (see **Figure 17**).

Figure 17. Resetting the emergency stop button.

8. Stand to the side of the spindle, then start the spindle and verify that the machine is operating correctly by pulling up on the spindle direction lever—the spindle should rotate counterclockwise.

   —When operating correctly, the machine runs smoothly with little or no vibration or rubbing noises.

   —Investigate and correct strange or unusual noises or vibrations before operating the machine further. Always disconnect the machine from power when investigating or correcting potential problems.

9. Press the emergency stop button to turn the lathe ***OFF*** and move the spindle direction lever to the center OFF position.

10. WITHOUT resetting the emergency stop button, pull up on the spindle direction lever. The machine should not start.

    —If the machine does not start, the emergency stop button safety feature is working correctly.

    —If the machine does start (with the emergency stop button pushed in), immediately disconnect power to the machine. The emergency stop button safety feature is not working correctly. This safety feature must work properly before proceeding with regular operations. Call Tech Support for help.

NOTICE

Make sure the headstock oil level is correct and all other parts are properly lubricated as outlined in this manual before you start the *Test Run*. Failure to do so could lead to premature failure of your lathe and will void the warranty.

11. Reset the emergency stop button, then restart the spindle rotation

12. For each of the safety features listed below, reset the tested safety feature.

    —When each safety feature is tested, the machine should not start indicating that the safety feature is working correctly.

    —If the machine does start when each safety feature is used, immediately use the emergency stop button to turn the machine ***OFF*** and disconnect the power to the machine. That safety feature is not working correctly. Each of these safety features must work properly before proceeding with testing or regular operations. Call Tech Support for help.

    a. Open the change gear door no more than 2"—the machine should not start.

    b. Lift the headstock cover no more than 2"—the machine should not start.

    c. Lift the chuck guard up no more than 2"—the machine should not start.

13. After successfully completing all the **Test Run** steps, proceed to **Spindle Break-In**.

Spindle Break-In

NOTICE

Successfully complete all of the spindle break-in steps to avoid rapid deterioration of the spindle bearings and other related parts.

To correctly break-in the spindle bearings:

1. DISCONNECT LATHE FROM POWER!
2. Make sure the lathe is properly lubricated (refer to **Lubrication** on **Page 47** for detailed instructions).
3. Set the motor and drive belts for the lowest spindle speed and engage the back gear (refer to **Spindle Speed** on **Page 34** for detailed instructions).
4. Disengage the power feed by moving the feed rod/leadscrew lever to the neutral (center) position (refer **Headstock Controls** on **Page 20**.
5. Re-connect the machine to power.
6. Pull up on the spindle direction lever to start spindle rotation counterclockwise. Let the lathe run for a minimum of 10 minutes.
7. Stop the spindle rotation and allow the spindle to come to a complete stop.
8. Push down on the spindle direction lever to start spindle rotation counterclockwise. Let the lathe run for a minimum of 10 minutes.
9. Stop the spindle and disconnect the machine from power.
10. Repeat **Steps 6–8** for each of the spindle speeds.
11. Turn the lathe ***OFF***. The spindle break-in is complete and your lathe is ready for operation.

Recommended Adjustments

For your convenience, the adjustments listed below have been performed at the factory.

However, because of the many variables involved with shipping, we recommend that you at least verify the following adjustments to ensure the best possible results from your new machine.

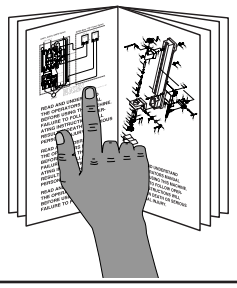
Step-by-step instructions for these adjustments can be found in the **SERVICE** section starting on **Page 53**.

Factory adjustments that should be verified:

- Gib adjustment (**Page 56**)
- Tailstock alignment (**Page 28**) and lock adjustment (**Page 57**)
- Cross slide backlash (**Page 57**)

SECTION 4: OPERATIONS

Operation Safety

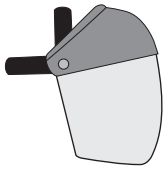


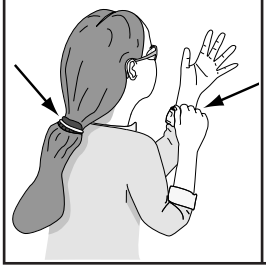
⚠WARNING

To reduce the risk of serious injury when using this machine, read and understand this entire manual before beginning any operations.

⚠WARNING

Damage to your eyes could result from using this machine without proper protective gear. Always wear safety glasses or a face shield when operating this machine.





⚠WARNING

Loose hair, clothing, or jewelry could get caught in machinery and cause serious personal injury. Keep these items away from moving parts at all times to reduce this risk.

NOTICE

If you have never used this type of machine or equipment before, We strongly recommend that you read books, trade magazines, or get formal training before beginning any projects. Regardless of the content in this section, Grizzly Industrial will not be held liable for accidents caused by lack of training.

Basic Controls

Headstock Controls

Use **Figure 18** and the descriptions below to become familiar with the headstock controls and their functions.

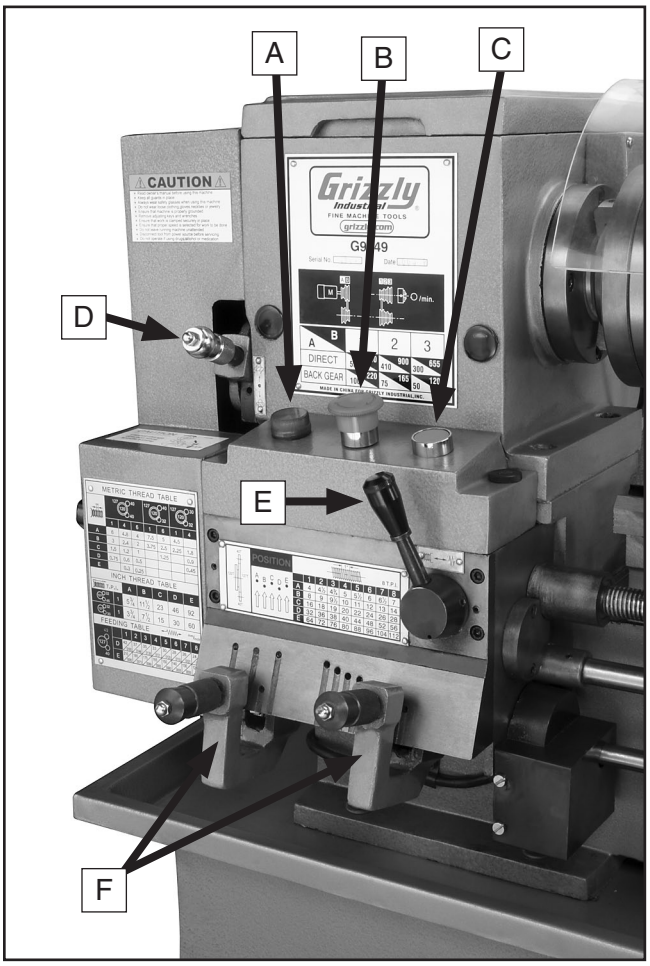


Figure 18. Headstock controls.

A. Power Lamp: Lights when power is available to the motor.

B. Emergency Stop Button: Stops the flow of power to the motor. This button must reset before the machine can start again.

C. Jog Button: Rotate the spindle clockwise when pressed.

D. Feed Direction Lever: Controls direction or stops (center position) the rotation of the feed rod or leadscrew.

E. Feed Rod/Leadscrew Lever: Selects feed rod rotation when positioned to the left, leadscrew rotation when positioned to the right, and stops the rotation of either when in the center position.

F. Feed Rate Selectors: Sets the feed rate of the feed rod or leadscrew.

Carriage Controls

Use **Figure 19** and the descriptions below to become familiar with the carriage controls and their functions.

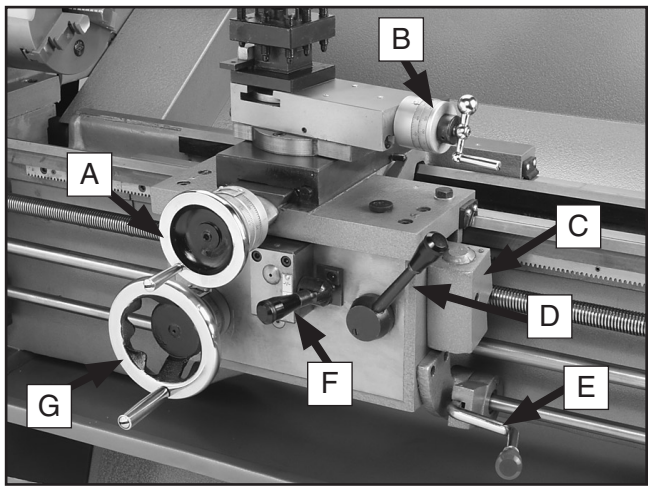


Figure 19. Carriage controls.

A. Cross Slide Handwheel: Moves the top compound slide toward and away from the workpiece.

B. Compound Slide Handwheel: Controls the position of the cutting tool relative to the workpiece.

C. Thread Dial: Indicates where to re-engage the leadscrew with the half-nut during threading operations.

D. Half-Nut Lever: Engages the half-nut with the leadscrew when in the down position, and releases the half-nut from the leadscrew when in the up position.

E. Spindle Direction Lever: Starts, reverses or stops the spindle rotation, and feed rod or leadscrew if engaged.

F. Feed change lever: Selects either the carriage or the cross slide to engage with the feed rod when in motion. Move the lever down to start the carriage moving along the spindle center line, and move the lever up to move the cross slide across the spindle center line.

G. Carriage Handwheel: Moves the carriage parallel to the spindle center line.

Tailstock Controls

Refer to the descriptions below and **Figure 20** to understand the tailstock controls.

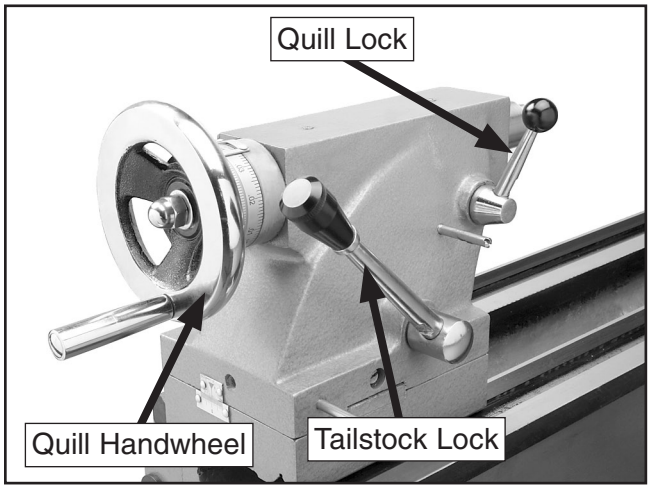


Figure 20. Tailstock with tailstock and quill lock in the locked positions.

Quill Lock: Locks the quill in position when pushed up, and frees the quill for movement when pulled down.

Tailstock Lock: Locks the tailstock in place on the bedway when pushed forward, and unlocks the tailstock when pulled back and down.

Quill Handwheel: Moves the quill toward the spindle when rotated clockwise, and retracts the quill into the tailstock when rotated counterclockwise. **Note:** *The graduated dial has marks in 0.001" increments on the upper portion of the dial and marks in 0.02mm increments on the lower portion.*

Chuck & Faceplate Mounting/Removal

The Model G9249 features a threaded 2¼"-8 spindle with a MT#3 taper. Mounting and removal procedures for the chucks and faceplate are the same.

Before storing, clean debris or built-up grime from the chucks and faceplate, then protect them with an application of products like Model H8257 Primrose Armor Plate with Moly-D Machine and Way Oil (see **ACCESSORIES** on **Page 42**).

Removing a Chuck or Faceplate

Tools Needed	Qty
Hex Wrench 6mm	1
Chuck Key	1
Dead Blow Hammer	1
Breaker Bar	1
Chuck Cradle	1

To remove a chuck or faceplate:

1. DISCONNECT LATHE FROM POWER!

2. Lay a chuck cradle (see **Figure 21**) or a layer of plywood over the bedways to reduce the risk of injury and to protect the precision ground surfaces of the bedways.

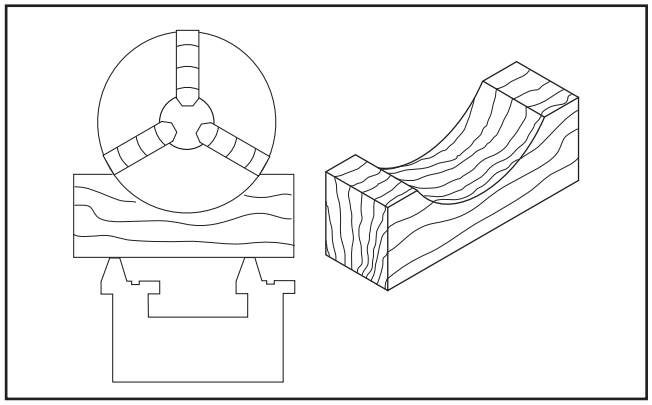


Figure 21. Simple chuck cradle made from scrap lumber.

3. Remove both spindle clamps from behind the chuck or faceplate (see **Figure 22**).

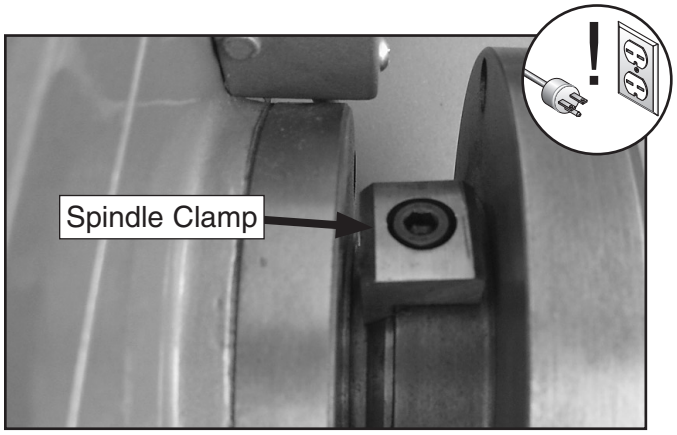
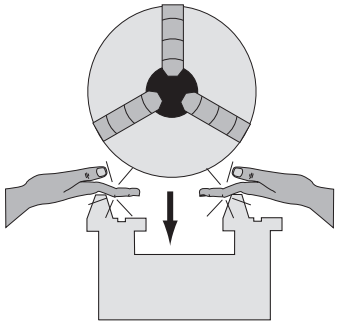


Figure 22. Spindle clamp.

4. Move the feed direction lever up or down to engage the change gears and prevent spindle rotation (see **Figure 23**).

Figure 23. Feed direction lever.

⚠WARNING



PINCH HAZARD! Protect your hands and the precision ground bedways with plywood or a chuck cradle when removing the lathe chuck! The heavy weight of a falling chuck can cause serious injury.

5. Lightly tap the breaker bar with the dead blow hammer to loosen the chuck or faceplate counterclockwise from the spindle threads.

   —If removing a chuck, open the jaws and slide the breaker bar between the jaws, as shown in **Figure 24**.

   —If removing the faceplate, mount clamps on the faceplate and use the breaker bar in a similar manner.

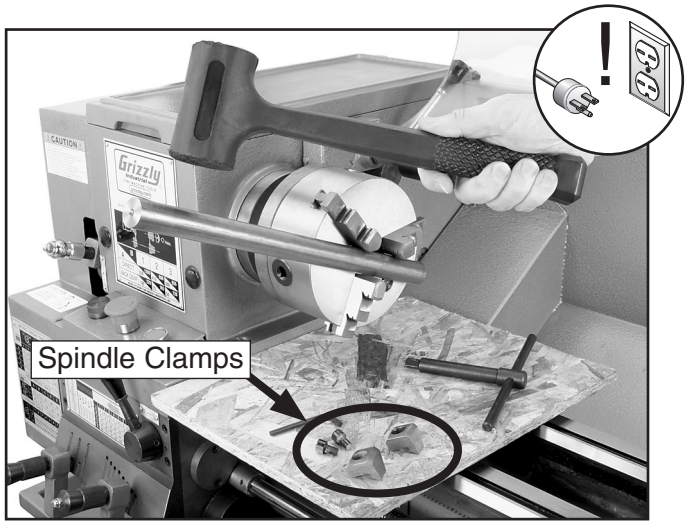


Figure 24. Loosening the chuck from the spindle threads.

6. Carefully unthread and remove the chuck or faceplate counterclockwise from the spindle threads.

Mounting a Chuck or Faceplate

1. DISCONNECT LATHE FROM POWER!

2. Lay a chuck cradle or a layer of plywood over the bedways to reduce the risk of injury and to protect the precision ground surfaces of the bedways.

3. Clean debris from the threads of the spindle and chuck or faceplate, then apply a thin film of light machine oil.

4. Carefully and slowly rotate the chuck or faceplate clockwise onto the spindle until you feel resistance.

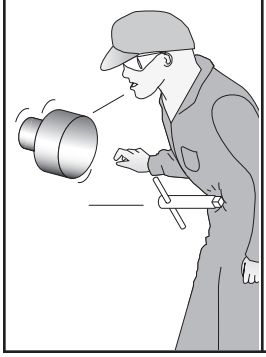
5. Rotate the chuck or faceplate counterclockwise a ¼ turn, then quickly rotate it back clockwise to seat the threads.

   Note: *Attempting to overtighten the chuck or faceplate will make removal difficult and could damage the threads.*

6. Firmly install both spindle clamps on the back of the chuck or faceplate.

   Note: *Make sure the spindle clamp tangs properly fit into the spindle groove before tightening the set screw (see* ***Figure 22****).*

7. Remove the chuck cradle or plywood and any tools used before starting the lathe.



⚠WARNING

Make sure the chuck or faceplate is firmly secure on the spindle and remove the chuck key. Object thrown from the lathe could cause serious personal injury or death to the operator or bystanders.

Mounting a Workpiece

Typically, a workpiece is mounted in a 3-jaw chuck, a 4-jaw chuck, a faceplate, or between centers. There are, however, numerous other methods of workpiece mounting for a lathe that are beyond the scope of this manual. Whichever work-holding device you use, make sure that the workpiece is held firmly and centered to ensure safe and accurate operation.

Using the 3-Jaw Chuck

The 3-jaw scroll-type chuck included with this lathe features hardened steel jaws that center the workpiece. When the operator opens or closes the jaws with the chuck key, the jaws move in unison.

There are two sets of jaws included with the 3-jaw chuck—inside and outside jaws. Use the correct jaws for the size and configuration of the workpiece to hold it firmly and securely on the chuck (see **Figure 25** for examples).

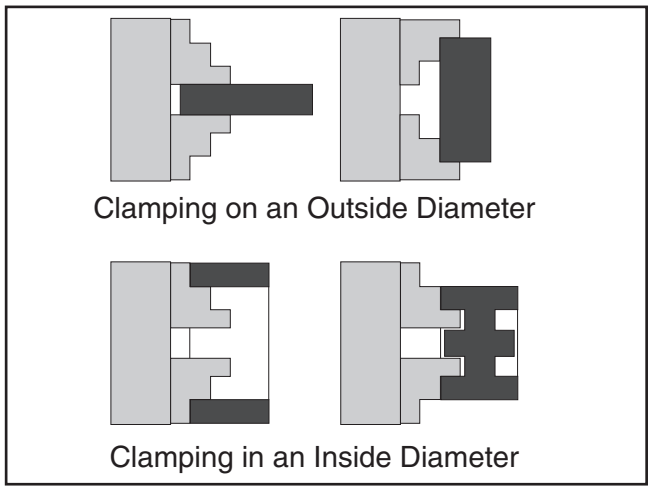


Figure 25. Example of using the 3-jaw chuck.

Tools Needed **Qty**
Chuck Key 1

To mount a workpiece in the 3-jaw chuck:

1. DISCONNECT LATHE FROM POWER!

2. Use the chuck key to open the jaws until the workpiece sits flat against the chuck face and jaw step, or fits in the chuck hole.

3. Close the jaws until they just make contact with the workpiece.

4. Turn the chuck by hand to make sure the workpiece makes even contact with all three jaws and is centered, as shown in **Figure 26**.

   —If the workpiece is not centered, loosen the jaws and adjust the workpiece.

   —If the workpiece is centered, fully tighten the jaws.

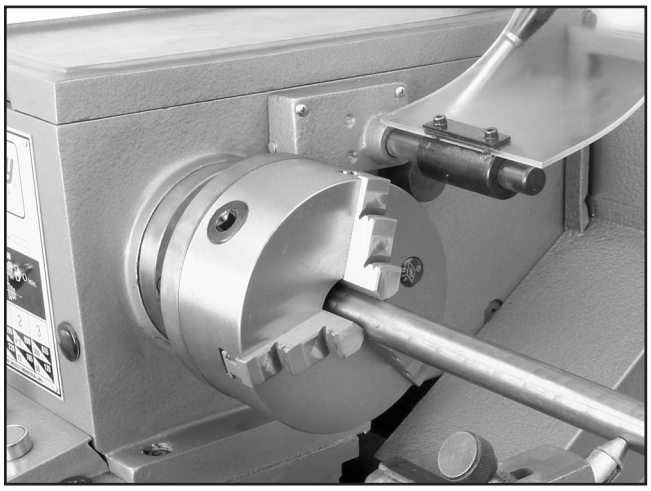


Figure 26. Example of workpiece firmly held in the center of the 3-jaw chuck.

Tools Needed **Qty**
Chuck Key 1

To remove and install the jaws:

1. DISCONNECT LATHE FROM POWER!

2. Use a piece of wood to protect the bedways.

3. Insert and turn the chuck key counterclockwise and back the jaws all the way out.

   Note: *If this is the first time you are removing the jaws, mark each jaw and its jaw guide with a numbers 1–3. Returning the jaws to the same jaw guide on the chuck will make installation easier.*

4. Clean the jaw mating surfaces and apply a film of light multi-purpose grease to these surfaces.

   Note: *Store jaws in a place free from moisture and abrasives.*

5. Rotate the chuck key clockwise until you see the tip of the scroll-gear lead thread just begin to enter the jaw guide, as shown in **Figure 27**.

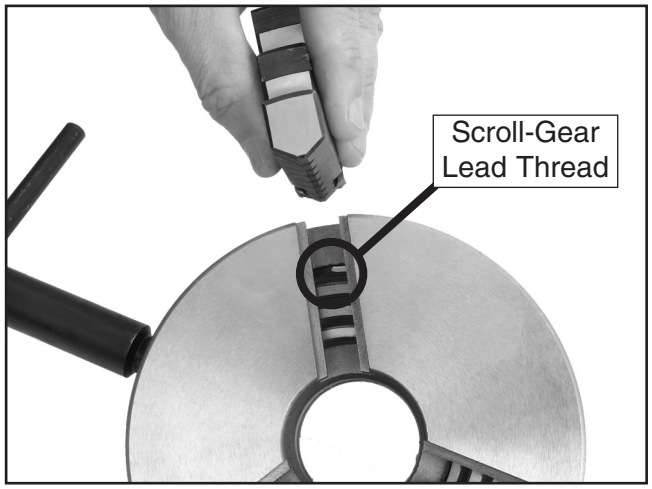


Figure 27. Installing jaw into the 3-jaw chuck.

6. Position the jaw with the beveled edge pointing to the center of the chuck, then insert the jaw into the jaw guide and hold it against the scroll-gear lead thread.

7. While firmly holding the jaw in place, rotate the chuck key clockwise one turn to engage the jaw with the scroll-gear threads.

   Note: *Pull on the jaw to make sure it is engaged with the scroll-gear.*

8. Repeat **Steps 6–7** with the remaining jaws.

   —If installed correctly, the three jaws will converge together at the center of the chuck.

   —If the jaws do not come together, repeat this procedure until they do.

Using the 4-Jaw Chuck

The 4-jaw chuck features independently adjustable hardened steel jaws to hold non-cylindrical or off-center workpieces. Each jaw can be removed from the chuck body and reversed for a wide range of work holding versatility.

Tools Needed	**Qty**
Chuck Key	1

To mount a workpiece on the 4-jaw chuck:

1. DISCONNECT LATHE FROM POWER!

2. Use a piece of wood to protect the bedways.

3. Use the chuck key to open each jaw until the workpiece can lie flat against the chuck face.

4. With assistance to hold the workpiece in place, tighten each jaw in small increments. After adjusting the first jaw, continue tightening in opposing sequence, as shown in **Figure 28**, until the workpiece is firmly secure in the desired position.

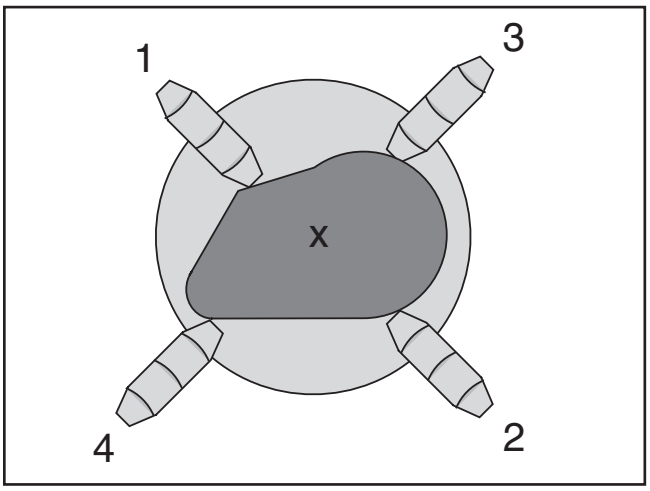


Figure 28. 4-jaw tightening sequence.

5. Make fine adjustments by using a test indicator and adjusting the jaws until the workpiece is precisely aligned (see **Figure 29**).

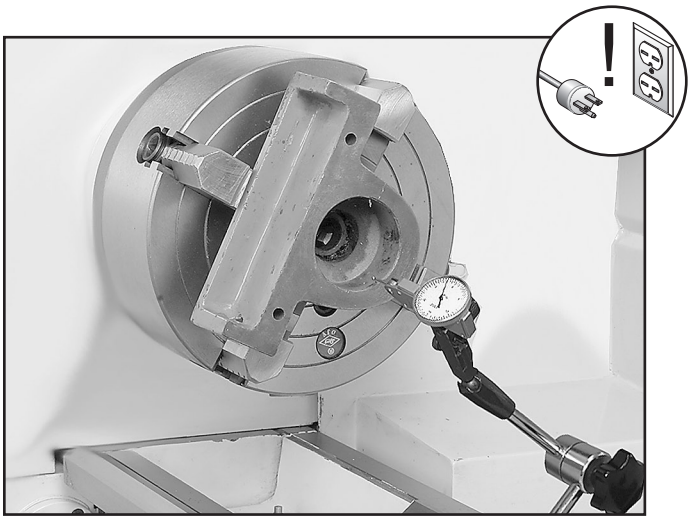


Figure 29. Example of using a test indicator to align a workpiece in a 4-jaw chuck.

⚠WARNING

Always use a low spindle speed when machining non-cylindrical or off-center workpieces to avoid ejecting the workpiece from the holding device at a high rate of speed. Failure to heed this warning could lead to serious personal injury or property damage.

Using the Faceplate

The faceplate can be used to turn non-cylindrical parts or for off-center turning by clamping the workpiece to it.

To mount a workpiece on the faceplate:

1. DISCONNECT LATHE FROM POWER!

2. Use a piece of wood to protect the bedways.

3. Secure the workpiece on the faceplate with a minimum of three independent clamping devices (see **Figure 30** for an example).

   Note: *Take into account the rotation and cutting forces that will be applied to the workpiece when clamping it to the faceplate.*

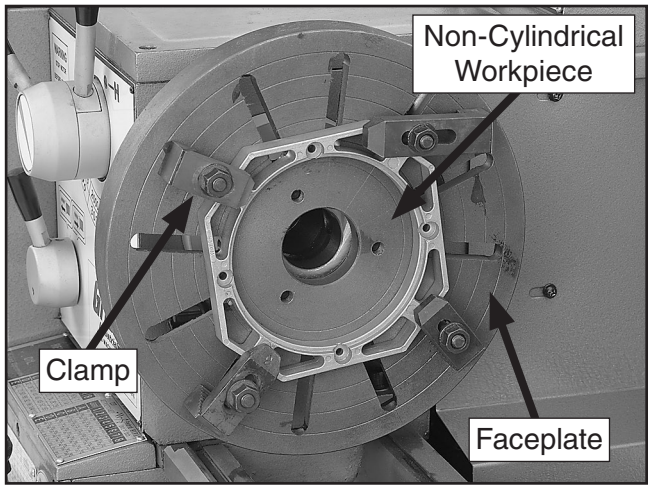


Figure 30. Example of a non-cylindrical workpiece mounted on the faceplate.

Centers

The Model G9249 includes one MT#3 live center and two MT#3 dead centers (see **Figure 31**). The supplied MT#5–MT#3 spindle sleeve fits into the spindle taper to hold an MT#3 center or tool.

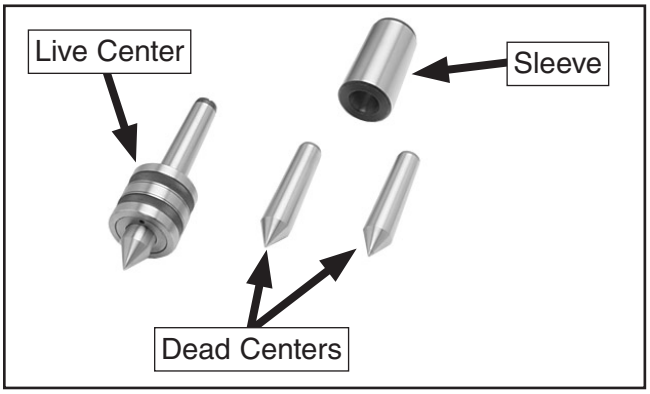


Figure 31. Centers and spindle sleeve.

The live center tip will rotate independently of the spindle or quill. The dead centers will spin with the spindle and remain stationary when used in the quill. Use these devices as required by your operation.

The steps to install and remove a center into the tailstock quill are detailed in the previous **Tailstock** subsection on **Page 27**.

Installing a Sleeve and Center into the Spindle

1. Clean away any grime or oily substance from the tapered mating surfaces of the sleeve and center.

2. Install the center into the spindle sleeve, then seat the assembly into the spindle.

3. Mount the faceplace to the spindle (see **Figure 32**).

   Note: *When using a dead center in the spindle, use a lathe dog so that your workpiece will rotate with the spindle and not spin on the dead center tip.*

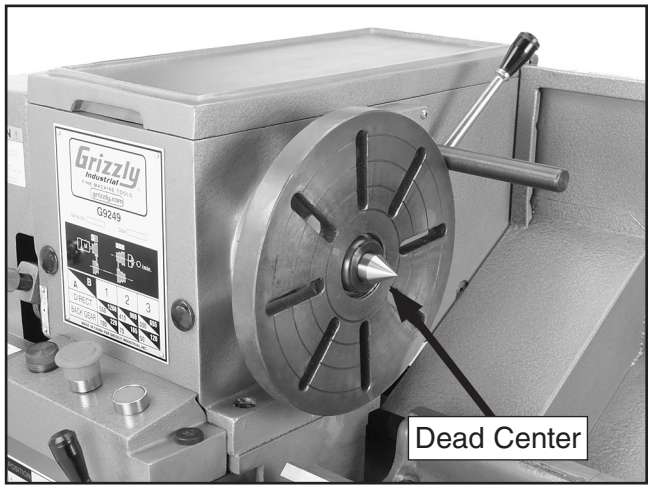


Figure 32. Dead center and faceplate installed on the spindle.

NOTICE

To avoid premature wear of the dead center or damage to the workpiece, always keep the dead center tip well lubricated.

Removing a Sleeve and Center from the Spindle

1. With assistance, hold a piece of wood up against the center to keep it from falling out of the spindle during the next steps.

2. Insert round bar stock at least 1-1/4" in diameter in the outbound end of the spindle tube and up against the back of the spindle sleeve.

3. Use a dead blow hammer to tap the bar with enough force to knock the spindle sleeve loose from the spindle taper.

   Note: *Use caution when inserting the bar stock into the spindle to avoid damaging the inside surface of the spindle tube.*

Tailstock

The tailstock of the Model G9249 can be used to support workpieces with the use of a live (rotating) or dead (stationary) center. Mount the drill chuck and arbor into the quill to center drill or bore holes. The tailstock can also be used for cutting shallow tapers by adjusting the offset.

Installing a Tapered Tool into the Quill

1. Position and lock the tailstock in place, and unlock the quill.

2. Rotate the quill handwheel clockwise to extend the quill about 1".

3. Clean debris and grime from the tapered mating surfaces of the tool and the inside of the quill.

4. Insert the tapered device into the quill until the taper is firmly seated. The matching tapers hold the device into the quill (see **Figure 33** for an example).

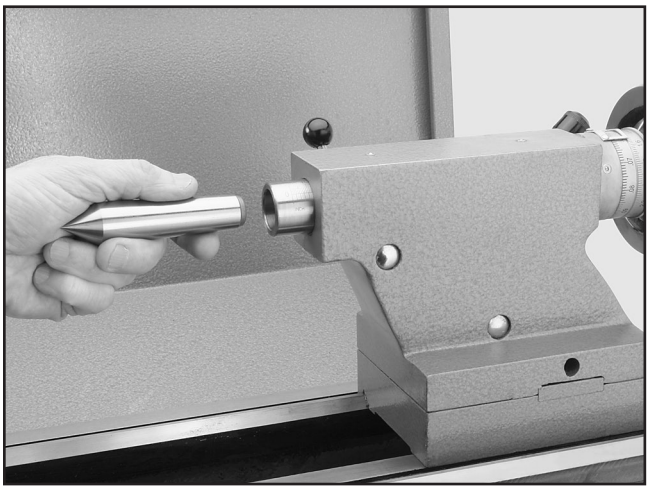


Figure 33. Inserting a tapered dead center into the tailstock quill.

5. Use the quill handwheel to move the tool toward and away from the rotating workpiece.

6. To remove the tapered tool, support it with one hand and retract the quill by turning the handwheel counterclockwise until the tool is pushed out.

Offsetting Tailstock

The tailstock can be positioned offset from the spindle, or moved side-to-side from the spindle center line. This tailstock feature is most often used when cutting a taper. When the tailstock is positioned toward the operator from the center line, the machined workpiece end nearest the tailstock will be smaller in diameter than the end near the spindle. Conversely, position the tailstock away from the operator across the center line to machine a workpiece taper near the spindle.

Note: *When using tailstock offset to cut tapers, you must use a center, faceplate, and lathe dog to mount the workpiece onto the spindle.*

Tools Needed	**Qty**
Standard Screwdriver	1

To set up the tailstock to cut a shallow taper:

1. Lock the tailstock in place, then loosen the lock screw at the rear of the tailstock shown in **Figure 34**.

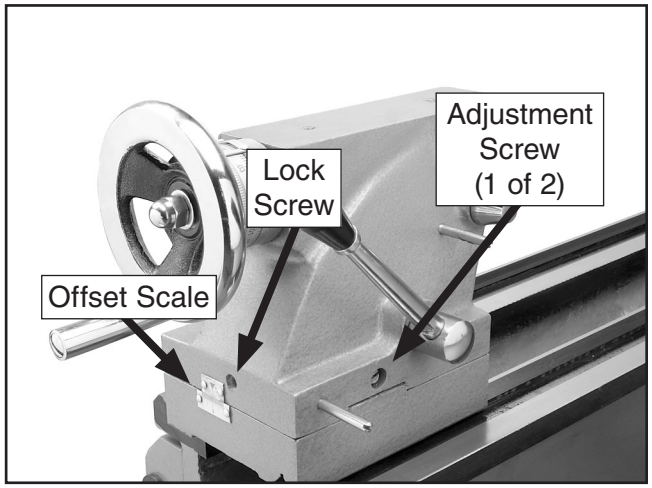


Figure 34. Tailstock offset controls.

2. Alternately loosen and tighten the adjustment screws on either side of the tailstock until the desired offset is indicated on the offset scale (see **Figures 34** and **35**).

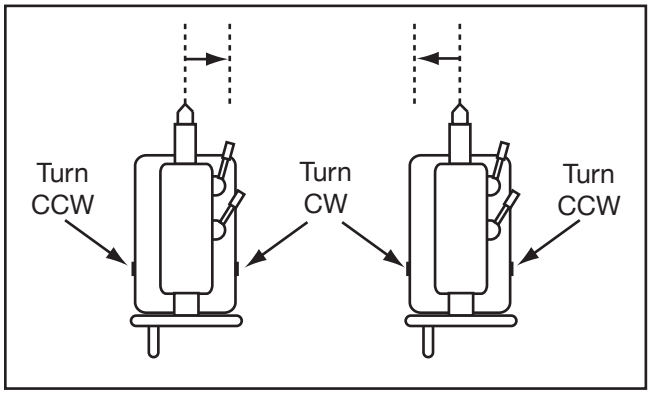


Figure 35. The effects of using the tailstock adjustment screws.

3. Re-tighten the lock screw to secure the offset.

   Note: *To return the tailstock to the center line, repeat the process until the centered position is indicated on the offset scale.*

Aligning Tailstock

The tailstock is aligned with the headstock at the factory. We recommend that you take the time to ensure that the tailstock is aligned to your own desired tolerances.

To align the tailstock with the headstock:

1. Using an machinist's precision level on the bedways, make sure the lathe is level side-to-side and front-to-back. If the lathe is not level, correct this condition before proceeding (refer to **Assembly and Placement** on **Page 14** for detailed instructions).

2. Get two pieces of steel round stock, 2" in diameter by 6" long.

3. Center drill both ends of one piece of the round stock and set it aside for use in **Step 6**.

   Note: *If the tailstock is slightly out of alignment by a few thousands of an inch, the center drill will find the center point during the drilling process. If the tailstock appears grossly out of alignment, move the tailstock until it appears to be near or at center (refer to* ***Cutting Tapers Using the Tailstock*** *on* ***Page 28****).*

4. Using the other piece of round stock, make a dead center by turning a shoulder to make a shank, then flip the piece over in the chuck and turn a 60° point (see **Figure 36** for an example).

   Note: *As long as the fabricated dead center remains in the chuck, the point of your center will remain true to the spindle axis or center line. Keep in mind that the point will have to be refinished whenever it is removed and re-installed in the chuck.*

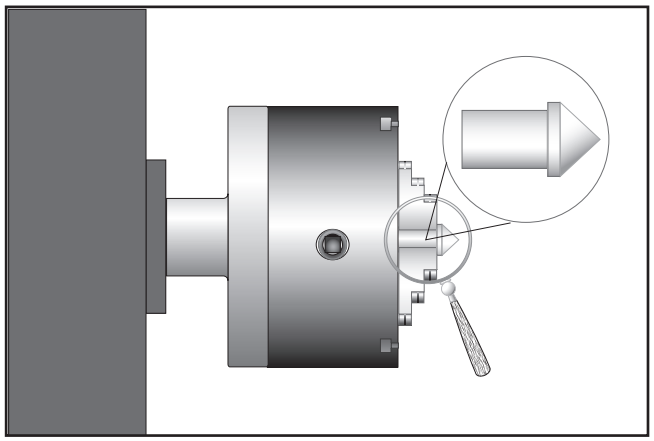


Figure 36. Tailstock centering dead center.

5. Place the live center in the tailstock.

6. Attach a lathe dog to the bar stock from **Step 3** and mount it between the centers (see **Figure 37**).

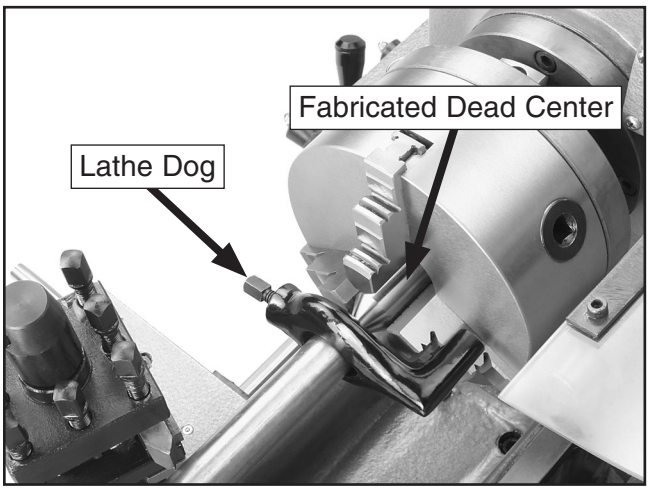


Figure 37. Round stock mounted between centers.

7. Turn approximately 0.010" off the diameter.

8. Mount a dial indicator so the dial plunger is on the tailstock barrel before making adjustments.

9. Measure the stock with a micrometer.

   —If the stock is *fatter* at the tailstock end, move the tailstock *toward* the operator *half* the distance of the amount of taper (see **Figure 38**).

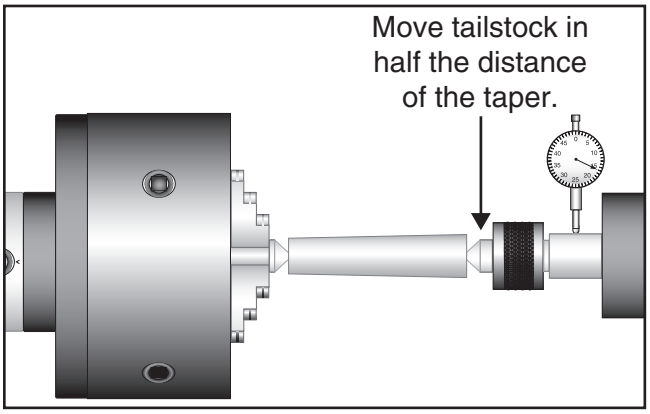


Figure 38. Tailstock adjustment toward the operator (viewed from above).

—If the stock is *thinner* at the tailstock end, move the tailstock *away* from the operator *half* the distance of the amount of taper (see **Figure 39**).

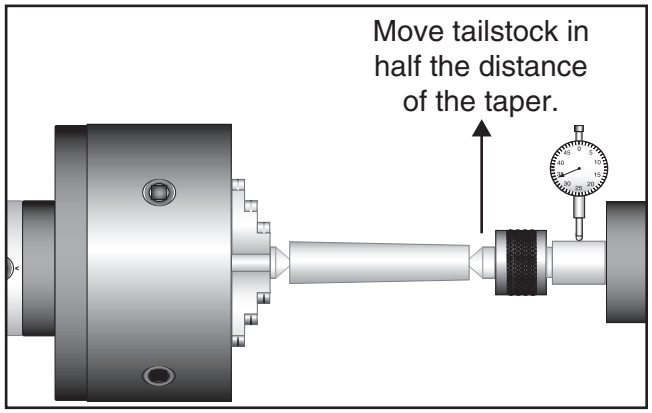


Figure 39. Tailstock adjustment away from the operator (viewed from above).

10. Refer to **Offsetting Tailstock** on **Page 28** for making adjustments to the tailstock position. Turn another 0.010" off the diameter and check for a taper. Repeat this process as necessary until the desired amount of accuracy is achieved.

Drilling with Tailstock

The tailstock can be used to drill holes by mounting a drill bit in the tailstock, rotating the workpiece with the spindle, then using the tailstock quill feed handwheel to advance the drill bit into the workpiece.

To set up the tailstock for drilling:

1. Lock the tailstock in position, then unlock the quill.

2. Use the quill feed handwheel to extend the quill about one inch out of the tailstock.

3. Insert the drill chuck arbor into the drill chuck (see **Figure 40**), then insert the assembly into the quill until the taper is firmly seated. The matching tapers hold the arbor.

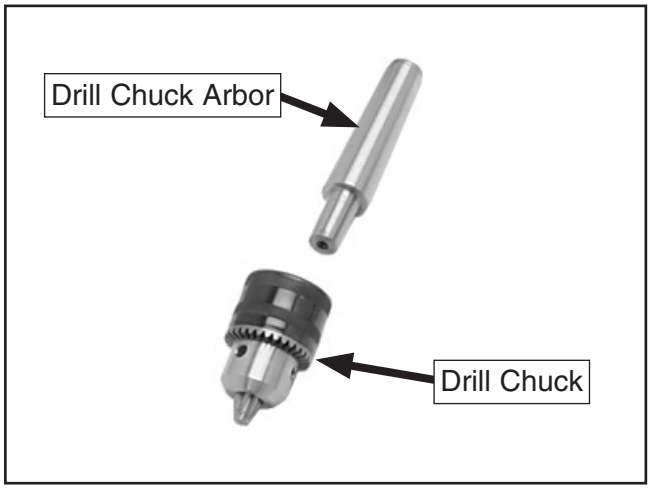


Figure 40. Drill chuck and arbor.

Note: *Alternately, MT#3 tapered drill bits can be used with the tailstock for drilling operations (see **Figure 41**).*

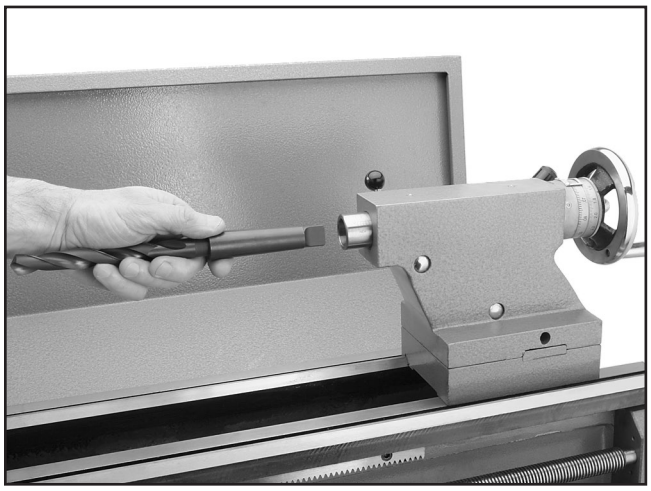


Figure 41. Inserting tapered drill bit into the tailstock quill.

To remove a tapered drill arbor or drill bit:

1. Turn the quill feed handle counterclockwise until the tool is pushed out from the tailstock taper.

Steady Rest

The steady rest serves as a support for long shafts where the length to diameter ratio is 3:1 or greater. The steady rest can be positioned anywhere along the length of the workpiece or bedway.

Tools Needed	Qty
Wrench 19mm	1
Wrench 10mm	1
Standard Screwdriver #1	1

To install and use the steady rest:

1. Remove the clamp hex nut, flat washer, and clamp block from the bottom of the steady rest.

2. Clean away any debris or grime from the bedways, the steady rest ways, and the clamp block.

3. Position the steady rest on the bedway so the triangular notch fits over the rear angled rail of the bedway, as shown in **Figure 42**, then re-install and tighten the clamp block.

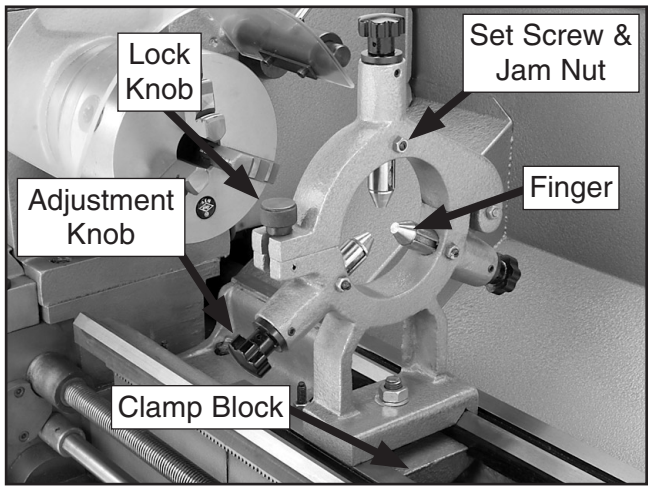


Figure 42. Steady rest controls.

4. Loosen the lock knob, swing it out of the way, then open the steady rest to fit the workpiece inside, as shown in **Figure 43**, then close and secure the top of the steady rest.

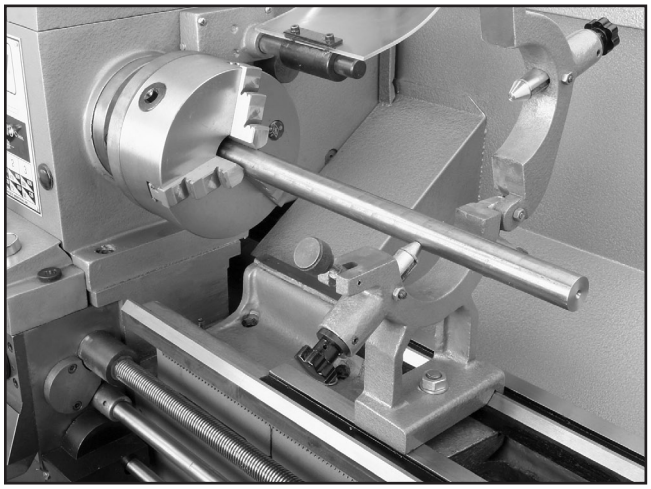


Figure 43. Workpiece positioned inside the steady rest.

5. Loosen the jam nuts and set screws (see **Figure 42**), turn the adjustment knobs to fit the fingers snug to the workpiece, then re-tighten the set screws and jam nuts.

   Note: *The fingers should be snug enough to fully support the workpiece at all three points and also allow free rotational movement of the workpiece.*

6. Lubricate the finger tips with an anti-seize grease during operation.

Follow Rest

The follow rest shown in **Figure 44** is mounted on the front of the saddle and follows the movement of the tool along the length of the workpiece. The follow rest is used on long, slender parts to prevent flexing of the workpiece from the pressure of the cutting tool. The follow rest requires only two fingers as the cutting tool acts as the third.

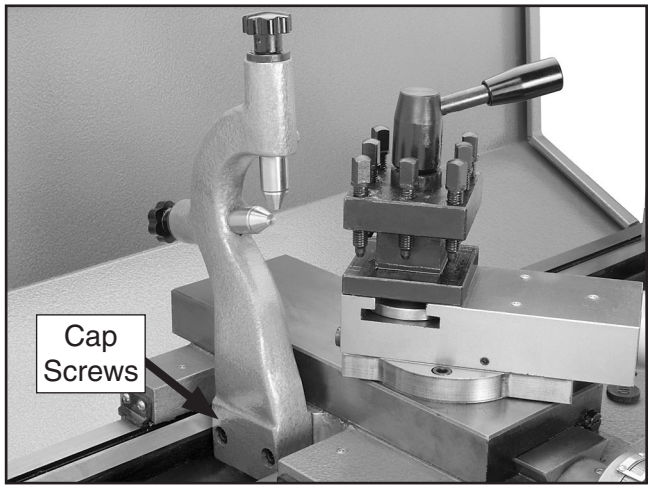


Figure 44. Follow rest mounted on the saddle.

The follow rest is installed/removed with two cap screws at the base. The fingers are set against the workpiece in the same manner as those of the steady rest. Always lubricate the finger tips with an anti-seize grease during operation.

Cross Slide

Handwheel Dial Increments	**Resolution**
Upper Marks	0.002"
Lower Marks	0.04mm

The cross slide sits directly on the saddle and moves perpendicular to the spindle center line when the handwheel is rotated (see **Figure 45**).

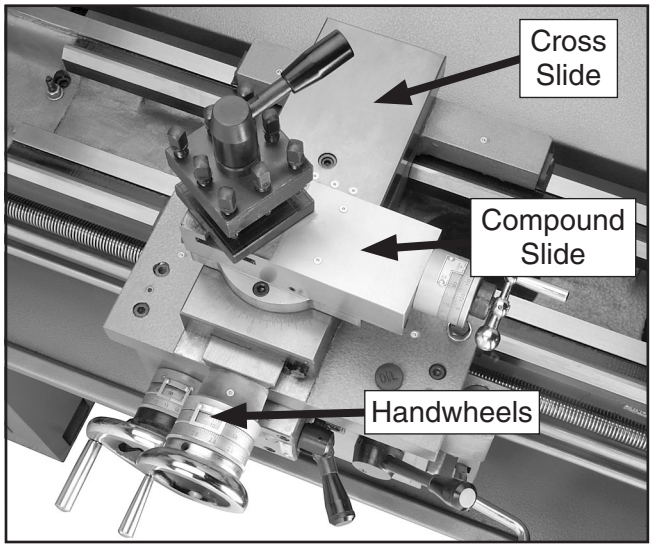


Figure 45. Cross and compound slides.

The cross slide graduated dial is a "direct read" dial. The actual distance the cross slide moves is ½ of the dial reading, but removes the amount the dial indicates from the diameter of the workpiece.

Compound Slide

Handwheel Dial Increments	Resolution
Black Marks	0.001"
Red Marks	0.02mm

The compound slide (see **Figure 45**) sits on the cross slide and is the base for the tool post. An important feature of the compound slide is that it can position the cutting tool at angles other than 90°, which is necessary when machining chamfers or when cutting threads.

Tools Needed	Qty
Hex Wrench 6mm	1

To set the compound slide angle:

1. Loosen the two cap screws on either side of the compound slide (see **Figure 46**).

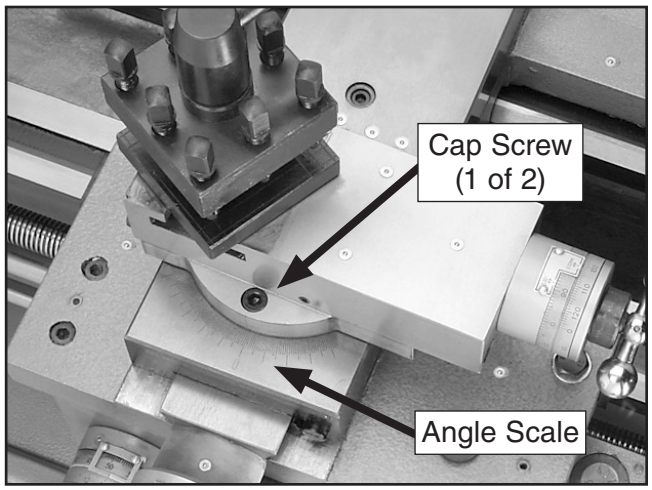


Figure 46. Compound slide angle controls.

2. Rotate the compound slide to the desired angle to the workpiece. Use the indicator mark on the base of the compound slide and the angle scale on top of the cross slide to determine the angle.

3. Re-tighten the two cap screws to secure the compound slide in position.

Tool Posts

The Model G9249 ships with a standard tool post and a 4-way tool post. The advantage of the 4-way tool post is that it can hold four tool holders or tools at one time that can be indexed (rotated) to the workpiece as needed.

Tools Needed	Qty
4-Way Tool Post Key	1

To load and use the 4-way tool post:

1. Loosen the tool post bolts until the tool fits underneath the bolts, as shown in **Figure 47**.

   Note: *To properly secure the tool, make sure a minimum of two post bolts are holding the tool.*

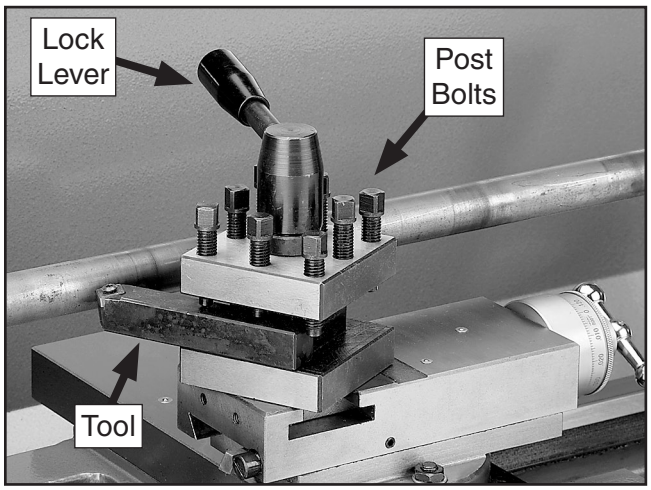


Figure 47. 4-way tool post with tool mounted.

2. Evenly and firmly tighten the post bolts to secure the tool.

3. Repeats **Steps 1–2** for the remaining tools.

4. Loosen the lock lever, rotate the tool post to index the desired tool, then re-tighten the lock lever to secure the tool post and tool.

   Note: *The 4-way tool post is aligned in four positions by an indexing pin in the compound slide that engages slots in the tool post base.*

Spindle Speed

To set the correct spindle speed for your operation, you will need to: 1) Determine the spindle speed needed for your workpiece, and 2) configure the belts and gears for the calculated spindle speed.

Calculating the Correct Spindle RPM

1. Use the table in **Figure 48** to determine the recommended cutting speed for the workpiece material.

Recommended Cutting Speeds		
	Average Tool Speed (sfm)	
Work Material	*Rough Cuts*	*Finish Cuts*
Magnesium	400	800
Aluminum	350	700
Brass & Bronze	250	500
Copper	100	250
Cast Iron (Soft)	100	250
Cast Iron (Hard)	50	150
Mild Steel	100	250
Cast Steel	70	150
Alloy Steels (Hard)	50	150
Tool Steel	50	150
Stainless Steel	60	180
Titanium	90	200
Hi Maganese Steel	40	100
Note: *These values are based on HSS cutting tools. For carbide cutting tools, double the average speed. These values are a guideline only. Refer to the MACHINERY'S HANDBOOK for more detailed information.*		

Figure 48. Cutting speed table.

2. Determine the final diameter, in inches, for the cut you are about to take.

   Note: *For this step, you will need to average out the diameters or work with the finish diameter for your calculations.*

3. Use the following formula to determine the correct spindle speed (RPM) for your operation:

$$\textbf{Spindle Speed} = \frac{\textbf{Cutting Speed (SFM) x 4}}{\textbf{Diameter of Cut}}$$

Configuring the V-Belts and Back Gear

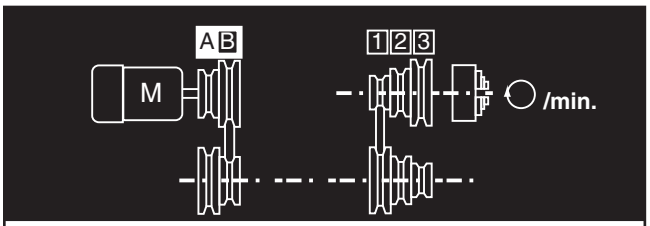
There are twelve spindle speeds are available by properly positioning the motor V-belt, spindle V-belt, and back gears.

To configure the V-belts:

1. DISCONNECT LATHE FROM POWER!

2. Refer to the chart in **Figure 49** and find the value closest to your calculated spindle speed.

   Note: *This chart is also on the front of the headstock. The "Direct" speeds are with the back gear disengaged. Instructions for engaging the back gear are on* ***Page 35****.*



A \ B	1	2	3
DIRECT	1200 / 550	900 / 410	655 / 300
BACK GEAR	220 / 100	165 / 75	120 / 50

Figure 49. Spindle speed configuration chart.

3. Release V-belt tension by pulling the belt tensioning lever forward, lift the headstock cover, then move the motor and spindle V-belts to the positions indicated by the chart in **Figure 49**.

   For Example: *If you require a spindle speed of 655 RPM, position the motor V-belt in the "**B**" position and the spindle V-belt in the "**3**" position, as shown in **Figure 50**.*

   Note: *In the example above, the back gears are not engaged.*

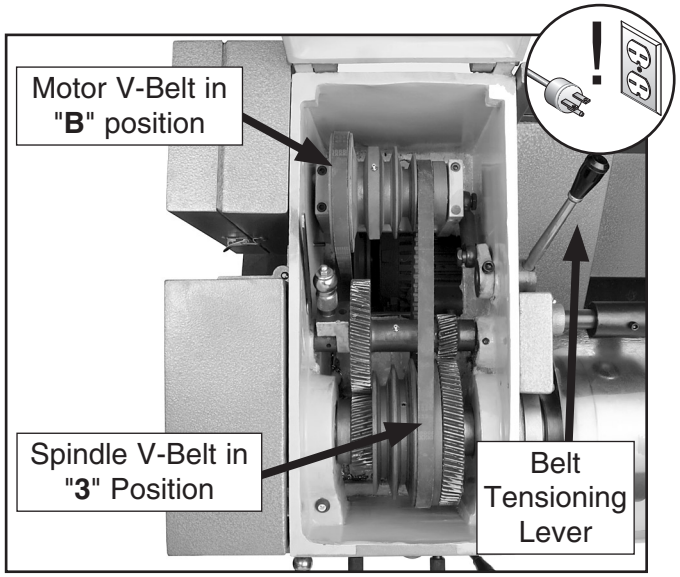


Figure 50. V-belt positions.

4. Close the headstock cover, then re-tension the V-belts by pushing the belt tensioning lever all the way back.

⚠WARNING

Always use the correct spindle speed and feed rate for your lathe operation to avoid the risk of injury to yourself or others from ejected workpieces or broken tools.

To engage the back gears:

1. DISCONNECT LATHE FROM POWER!

2. Pull out the lock pin shown in **Figure 51**, and rotate it 90° so that it stays in the "out" position.

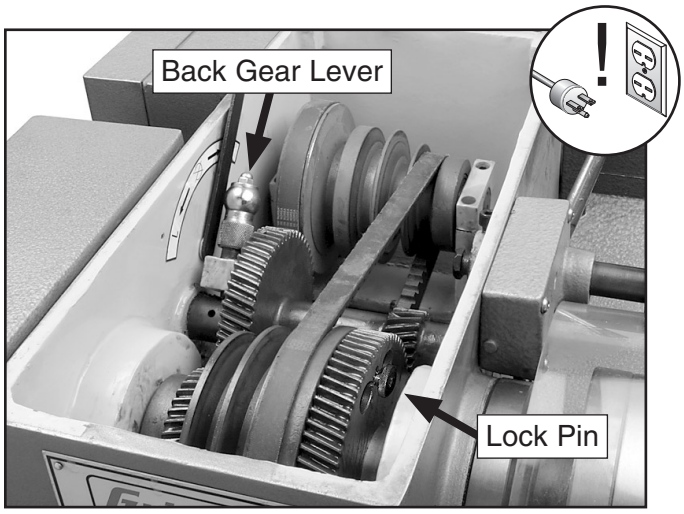


Figure 51. Back gear lever and lock pin.

3. Pull the back gear lever forward to engage the back gears with the spindle gears.

   Note: *It may be necessary to jog the spindle by hand to properly mesh the gears.*

To disengage the back gears:

1. DISCONNECT LATHE FROM POWER!

2. Push the back gear lever back to disengage the back gears from the spindle gears.

3. Rotate the lock pin 90°, then rotate the spindle gear until the lock pins slips into the indent on the pulley.

4. Move the spindle back and forth by hand to make sure the lock pin is securely seated in the pulley.

Power Feed

The rotating feed rod provides powered movement of the carriage or the cross slide. The carriage moves left or right along the spindle center line, and the cross slide moves in or out across the spindle center line.

Note: *Using the leadscrew for powered movement of the carriage is discussed in the* ***Threading*** *subsection starting on* ***Page 40****.*

NOTICE

High feed rates combined with high spindle speeds results in a rapidly moving carriage or cross slide. Pay close attention to the feed rate you have chosen and keep your hand poised over the feed change lever. Failure to fully understand how to operate the power feed can lead to carriage or cross slide crash that may permanently damage the machine.

To engage the feed rod:

1. Use the spindle direction lever to turn the spindle ***OFF,*** then allow the spindle to completely stop before making gear changes.

NOTICE

Always make sure the spindle is turned *OFF* and has come to a complete stop BEFORE changing gearing configurations to avoid the risk of permanently damaging your lathe.

2. Move the feed direction lever for the desired feed rod rotation direction and carriage/cross slide movement.

   Note: *All directions reverse when spindle rotation is reversed.*

3. Make sure the half-nut is disengaged from the leadscrew by moving the half-nut lever up.

4. Move the feed rod/leadscrew lever to the left for feed rod rotation.

5. Use the spindle direction lever to start the spindle rotation.

6. Return the feed rod/leadscrew lever to the center position to disengage the power feed from the feed rod.

NOTICE

Never engage the half-nut with the leadscrew when using the feed rod for carriage or cross slide movement. Failure to follow this instruction will lead to permanent damage to the carriage and leadscrew mechanisms.

Setting Feed Rate

Feed rate is determined by the machined material, the type of tooling used, and by the desired finish. Refer the table in **Figure 52** or the *Machinery's Handbook* for guidelines.

Note: *These instructions are valid only for feed rod power feed. Feed rate configuration for threading is discussed in the* ***Threading*** *subsection starting on* ***Page 40****.*

Recommended Feed Rates		
	Tool Feed Rate (IPR)	
Work Material	*Rough Cuts*	*Finish Cuts*
Magnesium	0.015–0.025	0.005–0.010
Aluminum	0.015–0.025	0.005–0.010
Brass & Bronze	0.015–0.025	0.003–0.010
Copper	0.010–0.020	0.004–0.008
Cast Iron (Soft)	0.015–0.025	0.005–0.010
Cast Iron (Hard)	0.010–0.020	0.003–0.010
Mild Steel	0.010–0.020	0.003–0.010
Cast Steel	0.010–0.020	0.003–0.010
Alloy Steels (Hard)	0.010–0.020	0.003–0.010
Tool Steel	0.010–0.020	0.003–0.010
Stainless Steel	0.010–0.020	0.003–0.010
Titanium	0.010–0.020	0.003–0.010
Hi Maganese Steel	0.010–0.020	0.003–0.010
Note: *These values are a guideline only. Refer to the MACHINERY'S HANDBOOK for more detailed information.*		

Figure 52. Feed rate table .

To set the feed rate:

1. Use the spindle direction lever to turn the spindle ***OFF***, then allow the spindle to completely stop before making gear changes.

2. Make sure the change gears are in the configuration 40T/127T/40T, as illustrated in **Figure 53** (refer to **Change Gears** on **Page 38** for detailed instructions).

   Note: *The Model G9249 ships with the change gears in the 40T/127T/40T configuration, which will cover most feed rates and inch threading.*

3. Refer to the table in **Figure 53** and find the value closest to your desired feed rate either in millimeters per revolution (top values) or in inches per revolution (bottom values).

   Note: *This table is also on the bottom of the label to the left of the feed rate selectors.*

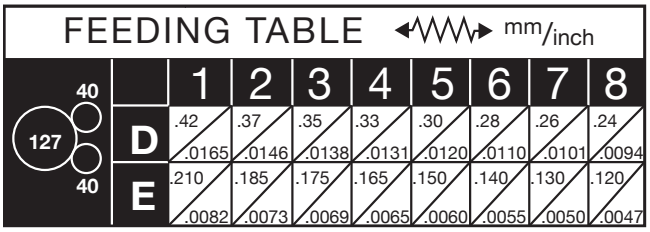


Figure 53. Feed rate table.

4. Pull the knob of the feed rate selector and rotate it down. Line up the selector with the desired indent, rotate the selector up, and allow the pin to engage into the indent (see **Figure 54**).

   Note: *It may be necessary to jog the spindle to facilitate movement of the selectors.*

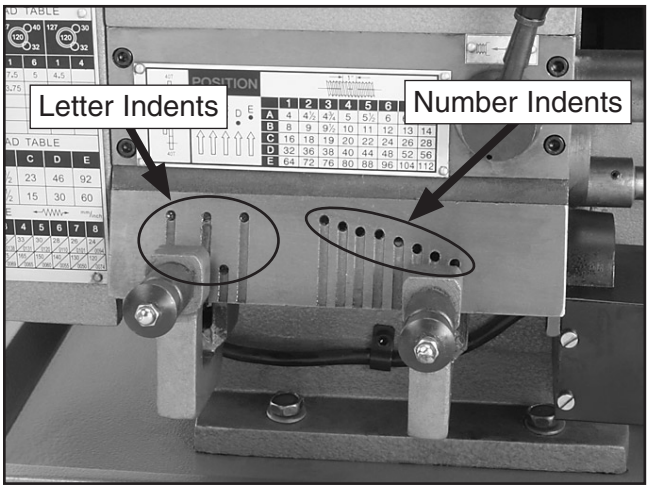


Figure 54. Feed rate selectors.

For Example: *The operation is a shallow finish cut on an aluminum workpiece. The chart in* ***Figure 52*** *recommends a feed rate of 0.005–0.100 IPR (inches per revolution). Because this is a shallow cut, we could select a feed rate of 0.0082 IPR. To set this feed rate, seat the left feed rate selector in the "****E****" indent, and the right selector in the "****1****" indent.*

Change Gears

Change gears are configured to provide a wider range of feed rates and inch/metric threading.

Use **Figure 55** and the descriptions below to become familiar with the components of the change gear system.

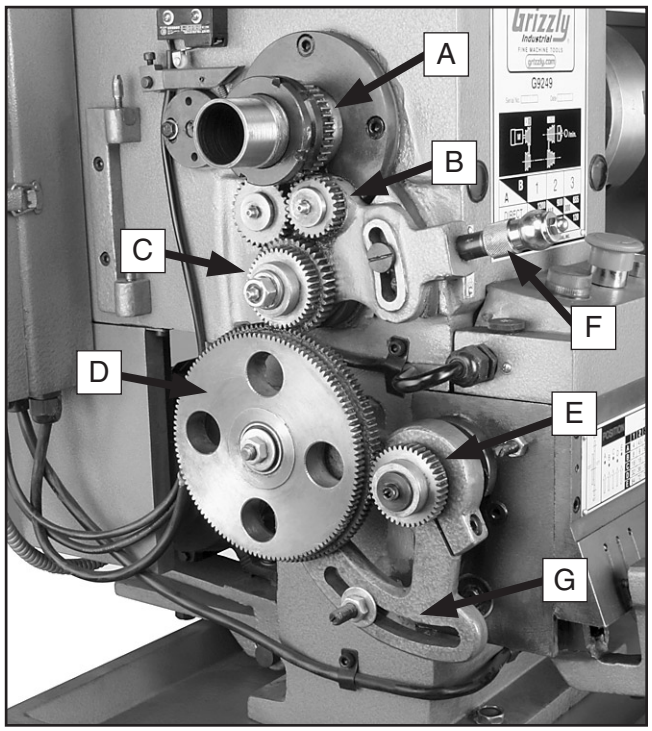


Figure 55. Change gear system.

A. Spindle Gear: Transfers power from the spindle to the change gear system.

B. Forward/Reverse Drive Gears: Selects clockwise or counterclockwise rotation of the feed rod or leadscrew.

C. Top Change Gear: Transfers power from the drive gears to the middle change gear.

D. Middle Change Gears: Transfers power from the top change gear to the bottom change gear. This is a 120T/127T combination gear.

E. Bottom Change Gear: Transfers power from the middle change gears to the feed rate gearbox.

F. Feed Direction Lever: Selects which forward/reverse drive gear will transfer power from the spindle gear to the change gears.

G. Pivot Bracket: Provides positioning of the middle change gear so that it correctly meshes with the top and bottom change gears.

Tools Needed	**Qty**
Hex Wrench 5mm	1
Wrench 16mm	1
Wrench 18mm	1

To re-configure the change gears:

1. DISCONNECT LATHE FROM POWER!
2. Open the change gear door.
3. Use the feed direction lever to engage one of the drive gears with the spindle gear to keep the change gears from rotating during the next step.
4. Loosen the hex nut on the top change gear, the hex nut on the middle change gears, and the cap screw on the bottom change gear.
5. Support the middle change gears, loosen the hex nut securing the pivot bracket, then allow the middle change gears and bracket to swing down.
6. Remove the retaining fasteners of the top and bottom change gears, then remove these gears.

7. Select the replacement gears as directed by the feed rate or threading chart (see **Figure 56** for an example of positioning).

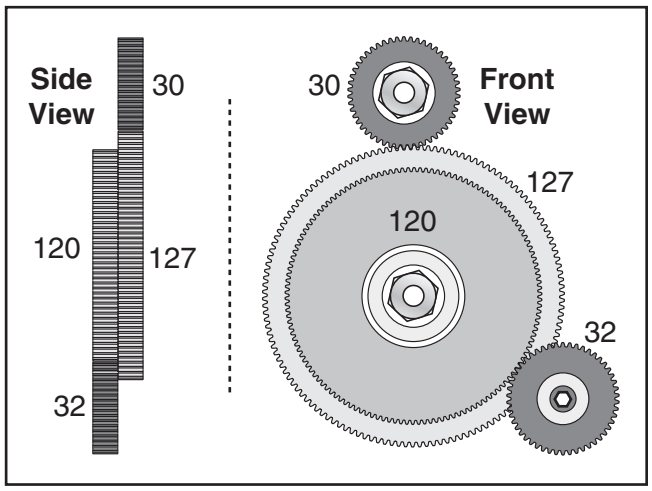


Figure 56. Change gear configuration example.

8. With the flange of the gear pointing away from the headstock (see **Figure 57**), align the keyway of the top change gear with the shaft key, then completely seat the gear on the shaft. Secure it in place with the flat washer and hex nut. DO NOT overtighten.

9. Mount the bottom change gear in a similar manner as the top change gear, and secure it in place with the flat washer and cap screw. However, you must choose the correct orientation of the gear flange.

— If the bottom change gear will engage the 127T (larger) middle change gear, point the gear flange away from the headstock.

— If the bottom change gear will engage the 120T (smaller) middle change gear, point the gear flange toward the headstock.

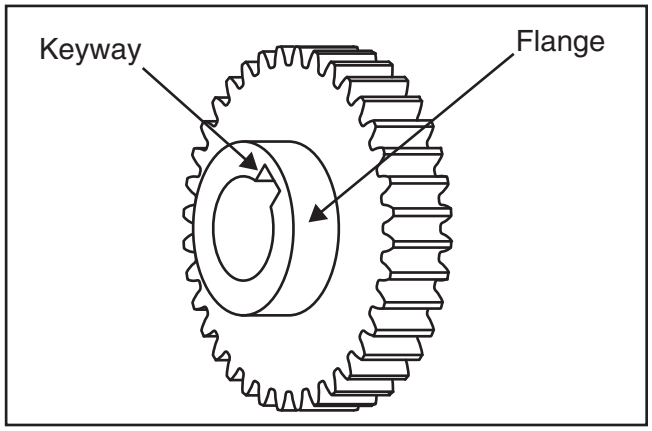


Figure 57. Change gear.

NOTICE

For smooth operation and to reduce wear of the change gears, always make sure to clean away debris and built-up grime, then apply a light film of multi-purpose gear grease to the gear teeth.

10. Swing the pivot bracket up to mesh the middle change gears with the top and bottom change gears.

Note: *It may be necessary to re-position the middle change gears on the pivot bracket to properly mesh with the top and bottom gears.*

11. Make sure there is a backlash of 0.002"–0.003" between the gears, then tighten the middle change gear hex nut and the pivot bracket hex nut.

Note: *Setting the gears too tight will cause excessive wear and noise. Setting the gears too loose may cause slippage and gear tooth breakage.*

12. Close and secure the change gear door before beginning operations.

Threading Operation

To cut threads:

1. Set the compound rest to the appropriate angle for the thread you want to cut. For a Unified National Series (UNF) thread, this is 29º off of vertical to the spindle axis.

2. If the thread dial (**Figure 58**) is not engaged with the lead screw, use a 5mm hex wrench to loosen the thread dial and rotate it to engage the lead screw, then tighten the dial.

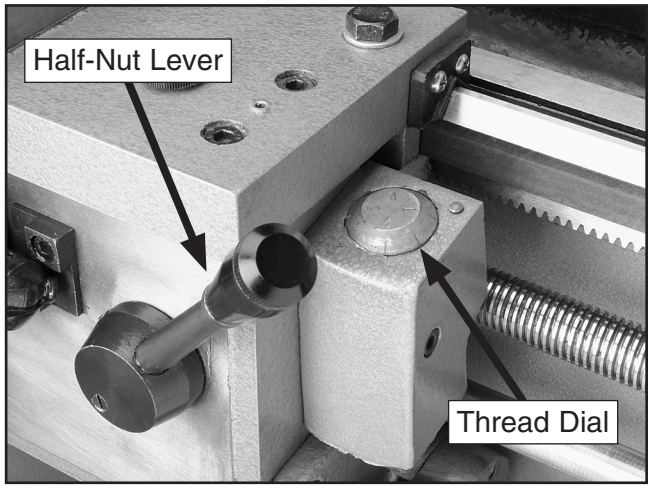


Figure 58. Thread dial and half-nut lever.

3. Select the RPM you want to use. A slower RPM will give you more time to react, especially if threading over a short distance or threading up to a shoulder.

4. Examine the thread charts (inch or metric) on **Page 41** and set the feed rate as explained on **Page 37**.

5. Turn ***ON*** the spindle to verify settings. Check to see that the lead screw is turning and verify that the carriage moves in the correct direction by engaging the half nut lever shown in **Figure 58**.

6. Once you are confident the settings are correct, disengage the half nut and turn ***OFF*** the spindle.

7. Examine the thread dial chart (see **Figure 59**) to determine which numbers on the thread dial will engage the half nut.

   Note: *To maintain accuracy and consistency, engage the half nut on the same mark on each pass. Failure to start on the same number each time may lead to cutting off the thread made in the previous pass*.

INDICATOR TABLE

T.P.I.	SCALE	T.P.I.	SCALE
4	1–4	23	1
4½		24	1–8
4¾		26	1 or 3
5	1	28	1–4
5½		32	1–4
6	1 or 3	36	1–4
6½		38	1 or 3
7	1	40	1–8
8	1–8	44	1–4
9	1	46	1 or 3
9½		48	1–8
10	1 or 3	52	1–4
11	1	56	1–8
11½		64	1–8
12	1–4	72	1–8
13	1	76	1-4
14	1 or 3	80	1–8
16	1–8	88	1-8
18	1 or 3	92	1–4
19	1	96	1–8
20	1–4	104	1–8
22	1 or 3	112	1–8
LEAD SCREW PITCH 8 T.P.I.			

Figure 59. Thread dial table.

8. The thread dial is unnecessary for cutting metric threads. Leave the half nut engaged until the threads are complete.

9. Set the tool tip perpendicular to the workpiece, center it vertically, and line up the tool for the initial cut.

NOTICE

DO NOT engage the half-nut when the spindle speed is over 200 RPM. Disregarding this notice may cause damage to the leadscrew or carriage components.

10. Turn ***ON*** the spindle and engage the half nut according to the thread dial to cut your threads.

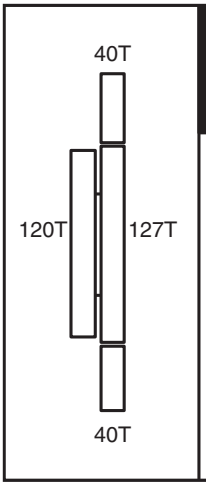
METRIC THREAD TABLE

mm	127 120 40 40			127 120 40 32		127 120 30 32	
	1	4	6	1	6	1	4
A	6	4.8	4	7.5	5	4.5	
B	3	2.4	2	3.75	2.5	2.25	1.8
C	1.5	1.2	1		1.25		0.9
D	0.75	0.6	0.5				0.45
E		0.3	0.25				

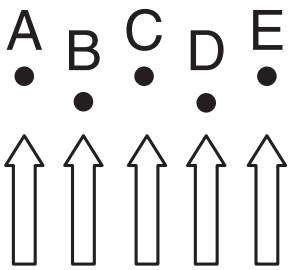
INCH THREAD TABLE

T.P.I.	A	B	C	D	E
127 32 46	1¾	11½	23	46	92
127 32 30	3¾	7½	15	30	60

Figure 60. Metric and additional inch thread chart.



POSITION



8 T.P.I.

	1	2	3	4	5	6	7	8
A	4	4½	4¾	5	5½	6	6½	7
B	8	9	9½	10	11	12	13	14
C	16	18	19	20	22	24	26	28
D	32	36	38	40	44	48	52	56
E	64	72	76	80	88	96	104	112

Figure 61. Inch thread chart.

SECTION 5: ACCESSORIES

G5562—SLIPIT® 1 Qt. Gel
G5563—SLIPIT® 12 oz Spray
G2871—Boeshield® T-9 12 oz Spray
G2870—Boeshield® T-9 4 oz Spray
H3788—G96® Gun Treatment 12 oz Spray
H3789—G96® Gun Treatment 4.5 oz Spray

Figure 62. Recommended products for protecting unpainted cast iron/steel part on machinery.

H8257—Primrose Armor Plate with Moly-D Machine and Way Oil 1 Quart
This superior machine and way lubricant prevents stick slip and chatter due to anti-friction capabilities resulting in greater precision machining capabilities. Provides the thinnest oil film possible while effectively providing needed lubrication and rust/corrosion protection. Adhesive/cohesive components are added for vertical surfaces. Resists squeeze out, running, dripping and non-gumming.

"This is good stuff! I use it on my lathes at home."
S. Balolia – President

Figure 63. Primrose Armor Plate Lubricant.

T10069—Quick Change Collet Set MT3 8-Pc.
T10070—Quick Change Collet Set MT3 16-Pc.
These high quality collet sets are made in a modern Taiwanese factory using German CNC machines. They are the best sets we have carried and can be used in production shops for precision work. Switch out end mills the easy way—just attach the quick change collet chuck to your lathe and slip your end mill into the appropriate collet. Spring collets are hardened and ground for maximum holding power and ultra precision. 8-pc. set includes quick change collet chuck, ¼", 5/16", 3/8", ½", 5/8", ¾", and 1" collets, spanner wrench and moulded plastic case. 16-pc. set includes quick change collet chuck, 1/8", 3/16", ¼", 5/16", 3/8", 7/16", ½", 9/16", 5/8", 11/16", ¾", 13/16", 7/8", 15/16", and 1" collets, spanner wrench and moulded plastic case.

Figure 64. Quick Change Collet Sets.

H3022—Measurement Tool Set
Includes magnetic base, 1" dial indicator (.001"), and 6" dial caliper (.001"). The extremely low price has made this a very popular seller!

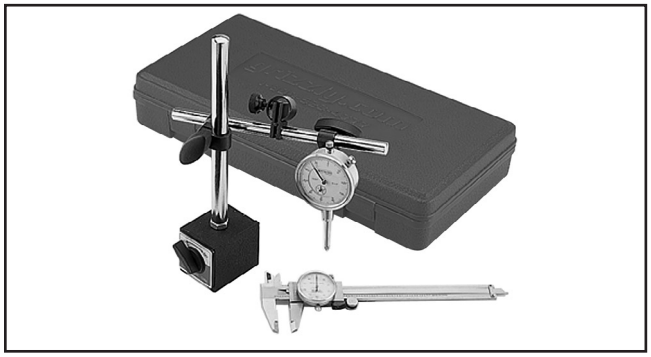


Figure 65. H3022 Measurement Tool Set.

20-Pc. Carbide Tipped Tool Bit Sets
G9775—¼"
G9776—⅜"
G9777—½"
An exceptional value for carbide lathe tool bits! Twenty piece sets offer tremendous savings over bits sold individually. Includes ten C-2 grade bits and ten C-6 grade bits for cutting steel and alloys.

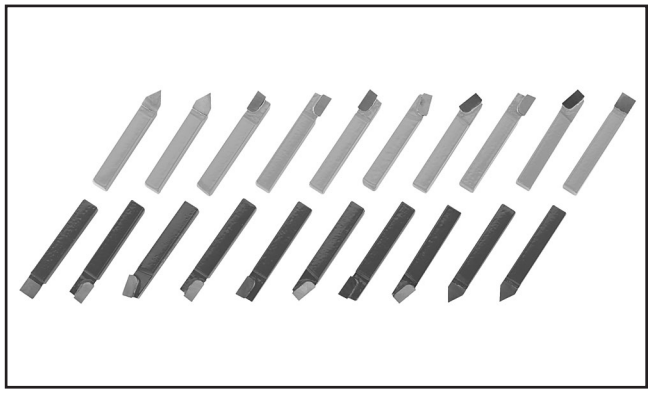


Figure 66. 20-Pc. Carbide Tipped Tool Bit Sets.

H2670—HSS Square Tool Bits
Our ground tool bits are M-2 HSS, making them some of the most durable tool bits around. Make your own specialized cutters in any shape using a silicon carbide grinding wheel (G8235-37) on your grinder.

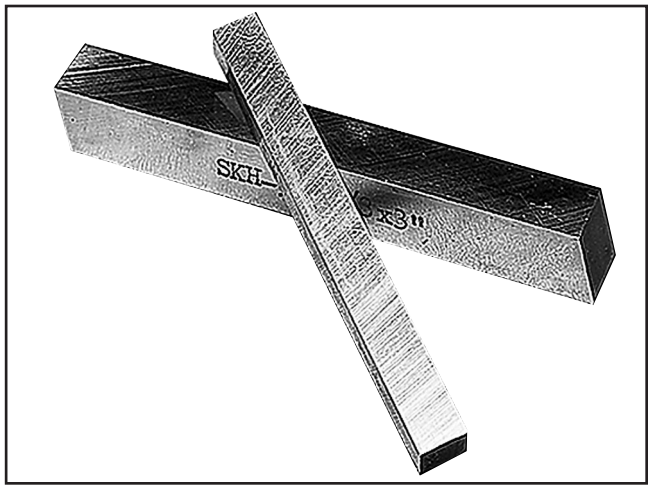


Figure 67. H2670 HSS Square Tool Bits.

Call 1-800-523-4777 To Order

Glance 7-Pc. Insert Turning Tool Sets
H5680—5/16"
H5682—1/2"
H5682—Carbide Inserts Package of 10
Here's a precision set for precision turning. These tools have been machined to exacting specifications and feature rugged tool steel bodies with black oxide finish. They all use the same carbide inserts that are indexable to use all four faces. Supplied in a fitted case.

Figure 68. Glance 7-Pc. Insert Turning Tool Sets.

G5640—5-Pc. Indexable Carbide Tool Set
G6706—Replacement TiN Coated Carbide Indexable Insert
Five-piece turning tool set features indexable carbide inserts with "spline" type hold-down screw that allow indexing without removing the screw. Each set includes AR, AL, BR, BL, and E style tools with carbide inserts, hex wrench, extra hold-down screws and a wooden case.

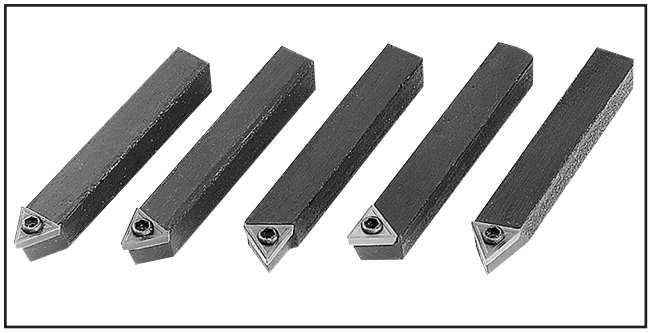


Figure 69. G5640 5 Pc. Indexable Tool Set.

H2972—Cut Off Holder with Blade
H4268—3/32" x 5/8" x 5" Replacement Blade
Small enough to fit most 4-way turret tool posts, but rugged enough to handle the job, this cut-off tool holder is a must. Comes with a wrench and cut-off tool bit. Uses 3/32" x 5/8" x 5" tool bits. Shank measures ½" x ¼" x 3".

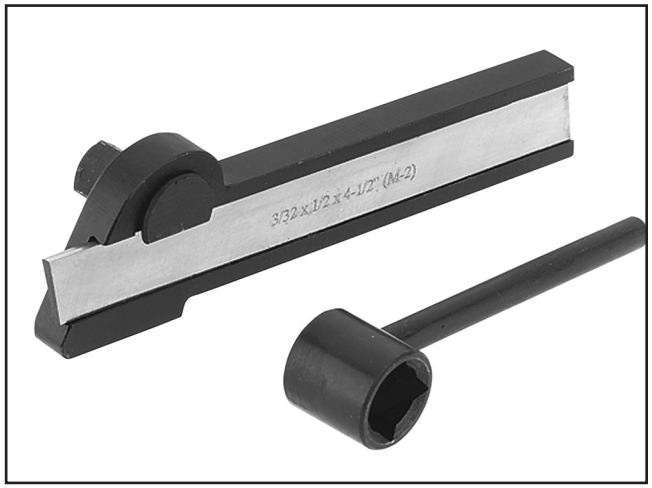


Figure 70. H2972 Cut Off Holder with Blade.

H2996—Double Ended Boring Bar
This is a well made boring bar and holder. The boring bar holds the tool bit at 90° at one end and 45° at the other. Comes with a wrench and tool bit. Bar size is 3/8" x 4½", holder is 2¼" x ½", uses 1/8" tool bits.

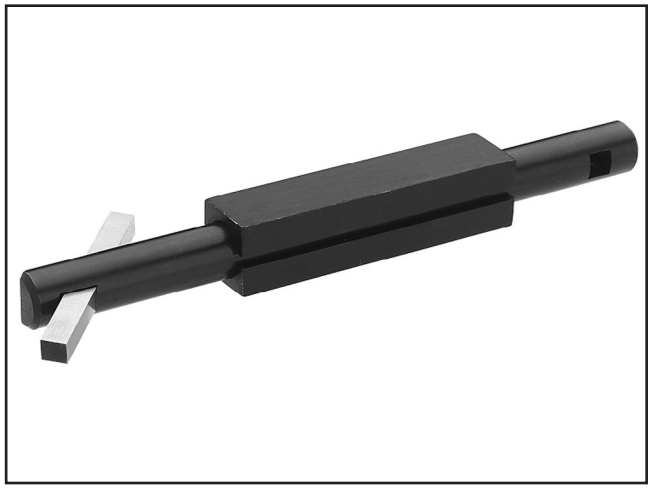


Figure 71. H2996 Double Ended Boring Bar.

H5936—2 Pc. Knurling Tool Set
This 2 piece set includes a ½" x 4" Single Knurling Toolholder and a ½" x 4½" Double Knurling Toolholder with Pivoting Head. Both have a black oxide finish.

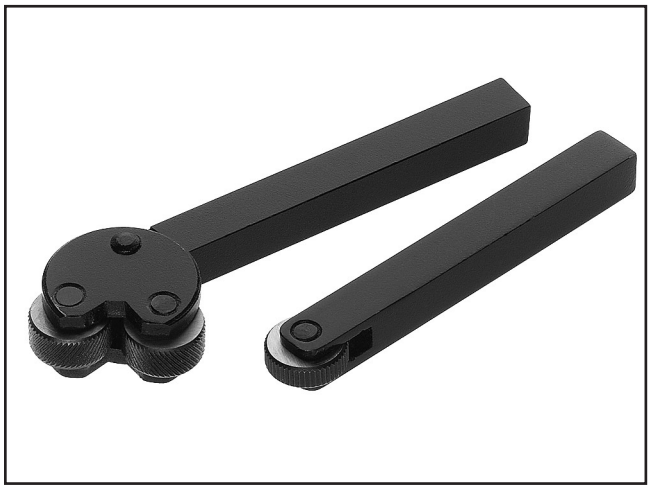


Figure 72. H5936 2 Pc. Knurling Tool Set.

H2987—½" Bent Lathe Dog
H2988—1" Bent Lathe Dog
H2989—1½" Bent Lathe Dog
H2990—2" Bent Lathe Dog
H2991—3" Bent Lathe Dog
Just the thing for precision machining between centers! These bent tail Lathe Dogs are made of durable cast iron and feature square head bolts.

Figure 73. H2987-91 Lathe Dogs.

Call 1-800-523-4777 To Order

G1070—MT3 Live Center Set
A super blend of quality and convenience, this live center set offers seven interchangeable tips. High-quality needle bearings prolong tool life and special tool steel body and tips are precision ground. Supplied in wooden box.

Figure 74. G1070 Live Center Set.

G9256—6" Dial Caliper
G9257—8" Dial Caliper
G9258—12" Dial Caliper
These traditional dial calipers are accurate to 0.001" and can measure outside surfaces, inside surfaces, and heights/depths. Features stainless steel, shock resistant construction and a dust proof display. An absolute treat for the perfectionist!

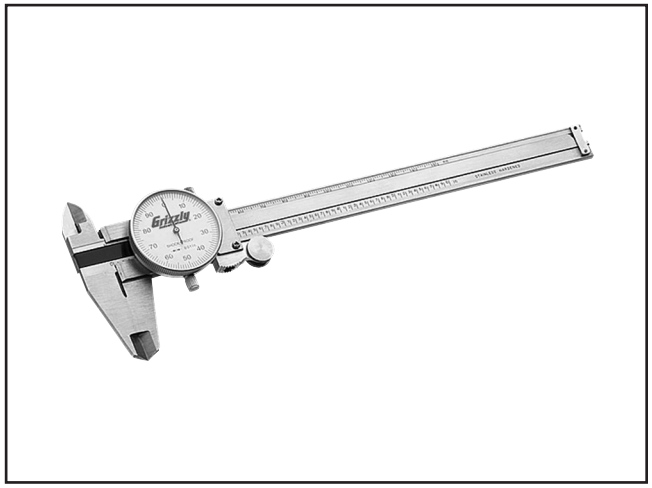


Figure 75. Grizzly® Dial Calipers.

Call 1-800-523-4777 To Order

G9849—Magnetic Base/Dial Indicator Combo
Precision measurements and setups have never been so easy. Magnetic base engages with just the turn of a switch and allows pinpoint adjustment. The dial indicator features 0–1" travel and has a resolution of 0.001". This fine set includes a molded case for protection and convenience.

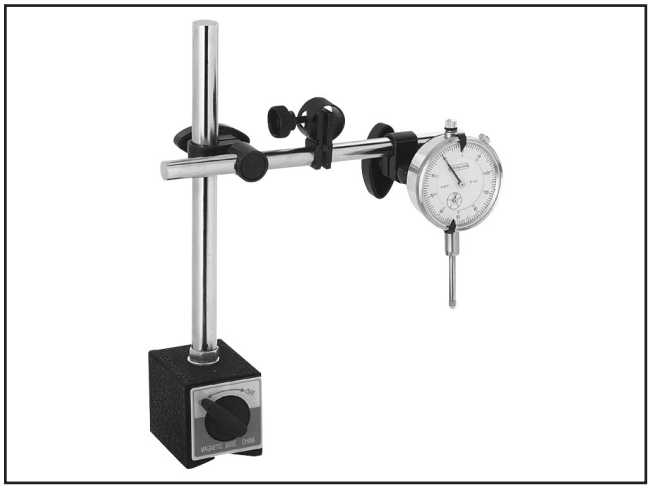


Figure 76. G9849 Magnetic Base/Dial Indicator Combo.

H6879—Lathe Operation & Maintenance Book
This detailed metal lathe book provides extensive coverage of a wide variety of metalworking operations. Special emphasis is placed on lathe components, accessories, and operating procedures, including basic machine setup and routine maintenance. A "must have" reference for all metal lathe owners. 260 pages.

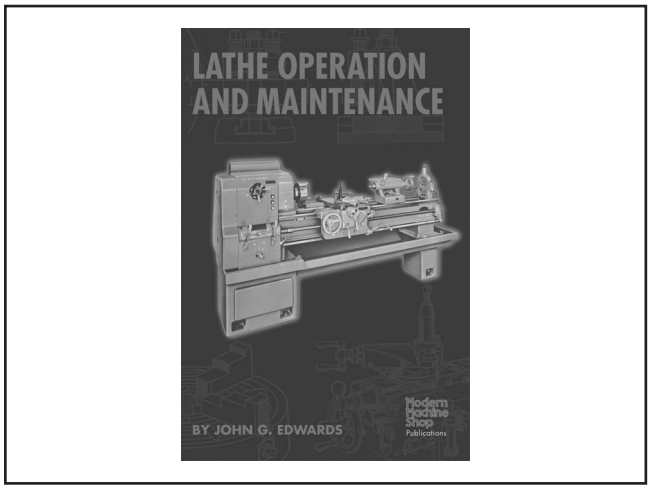
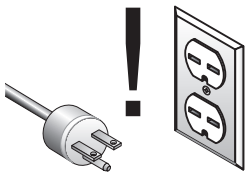


Figure 77. H6879 Lathe Operation & Maintenance Book.

SECTION 6: MAINTENANCE



⚠WARNING

Always disconnect power to the machine before performing maintenance. Failure to do this may result in serious personal injury.

Schedule

For optimum performance from your machine, follow this maintenance schedule and refer to any specific instructions given in this section.

Daily Check:
- Loose mounting bolts.
- Damaged or worn belts (**Page 51**)
- Worn or damaged wires.
- Any other unsafe condition.

Before Beginning Operation & Every 8 Hours of Operation:
- Clean lathe
- Lubricate headstock components (**Pages 47–48**)
- Lubricate feed rate gearbox (**Page 48**)
- Lubricate ball oilers (**Page 50**)

Every 40 Hours of Operation:
- Lubricate apron gearbox (**Page 49**)
- Lubricate back gear shaft (**Page 50**)

After First 3 Months of Operation and Annually:
- Change headstock oil (**Page 47**)

Cleaning & Protecting

- Disconnect the lathe from power before cleaning.
- Vacuum excess metal chips as they accumulate and wipe off built-up grime.

⚠CAUTION

DO NOT use compressed air to blow away chips from the lathe to avoid the risk of flying metal debris injuring yourself or others, or driving the chips deep into the lathe mechanisms resulting in damage or premature wear.

- Use a dry cloth to wipe off any remaining coolant at the end of the day. Metal chips left on the machine soaked with water-based coolant will invite oxidation and gummy residue to build up around moving parts.
- Follow Federal, State, and the manufacturer's requirements to properly dispose of used coolant and cleaning products
- Protect the unpainted cast iron surfaces on the lathe by wiping them clean after every use—this ensures moisture does not remain on bare metal surfaces.
- Keep unpainted cast iron surfaces, especially the bedways, rust-free with regular applications like Model H8257 Primrose Armor Plate with Moly-D Machine and Way Oil (see **ACCESSORIES** on **Page 42**).

Lubrication

Your lathe has numerous moving metal-to-metal contacts that require proper lubrication to help ensure efficient and long-lasting operation.

Other than lubrication points covered in this section, all other bearings are internally lubricated and sealed at the factory. Simply leave them alone unless they need to be replaced.

Before adding lubricant, clean away any debris and grime from the lubrication point to avoid contaminating the lubricant and increasing wear of the moving parts.

DISCONNECT THE LATHE FROM POWER BEFORE PERFORMING LUBRICATION PROCEDURES!

Spindle Bearing Oil

Lubricant	Frequency	Qty
ISO 68 SAE 20W Bearing and Gear Lubricant	Every 8 Hours of Operation	Fill to Half on Sight Glass

To add oil to the spindle bearing reservoirs:

1. Raise the headstock cover, then remove the oil plugs shown in **Figure 78**.

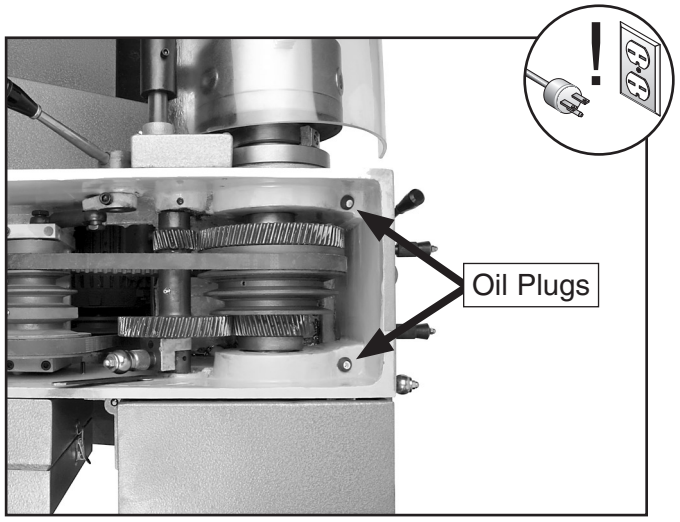


Figure 78. Spindle bearing reservoir oil plugs.

2. Fill both spindle bearing reservoirs with oil until the oil level in the sight glasses shows at least half-way (see **Figure 79**).

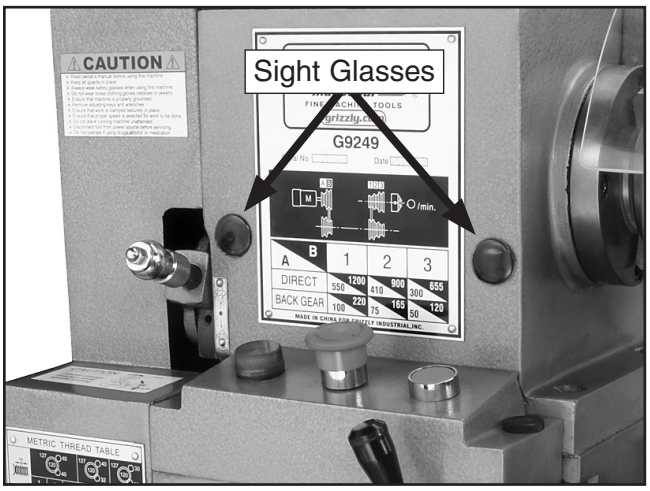


Figure 79. Spindle bearing reservoir oil sight glasses.

3. Clean away any spilled oil, replace the oil plugs, and lower the headstock cover.

To change the spindle bearing oil:

1. Start the spindle rotation and let it run for approximately 20 minutes to warm up the oil.

2. Remove the oil plugs shown in **Figure 78**.

3. Remove the oil sight glasses shown in **Figure 79**, then completely drain the spindle bearing oil reservoirs.

4. Replace the oil sight glasses, and re-fill the reservoirs as instructed in the previous subsection.

NOTICE

Follow reasonable lubrication practices as outlined in this manual for your lathe. Failure to do so could lead to premature failure of your lathe and will void the warranty.

Headstock Change Gears

Lubricant	Frequency	Qty
Multi-Purpose Gear Grease	Every 8 Hours of Operation	One Pump to Fittings; Thin Coat to Gears

Add one pump from a grease gun to the three headstock grease fittings shown in **Figure 80**. Use a brush to apply a thin coat of grease to the gear teeth.

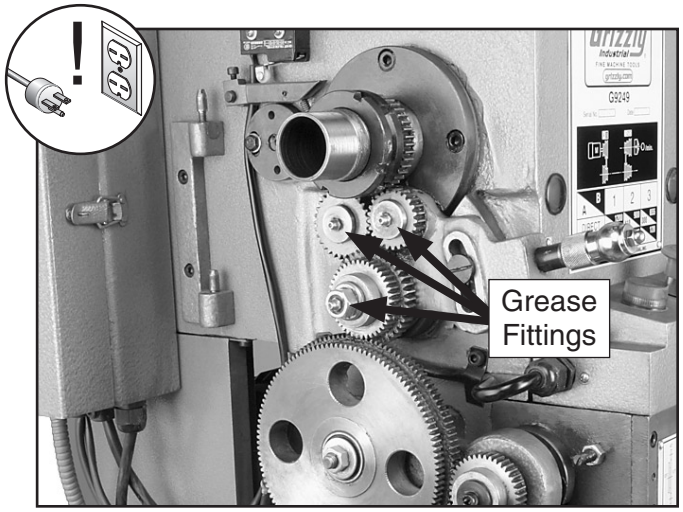


Figure 80. Headstock grease fittings.

Headstock Idler Pulley Shaft

Lubricant	Frequency	Qty
Multi-Purpose Gear Grease	Every 8 Hours of Operation	One Pump

Add one pump from a grease gun to the idler pulley grease fitting shown in **Figure 81**.

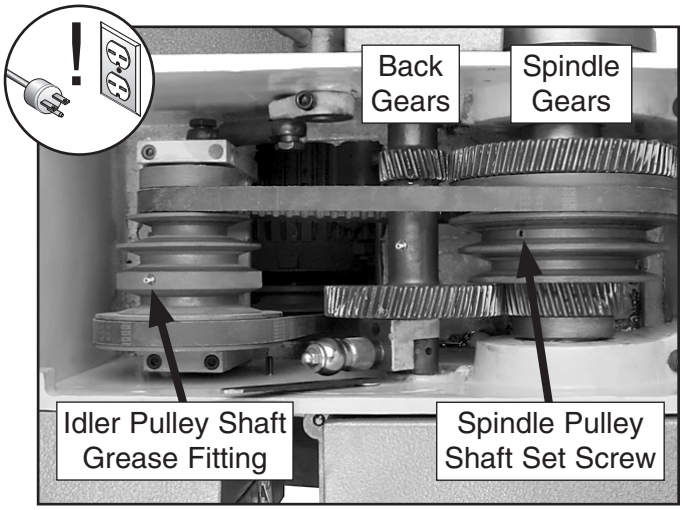


Figure 81. Headstock pulley shaft lubrication points.

Headstock Gears

Lubricant	Frequency	Qty
Multi-Purpose Gear Grease	Every 8 Hours of Operation	Thin Coat

Use a brush to apply a thin coat of grease to the gear teeth of the spindle and back gears (see **Figure 81**).

Headstock Spindle Pulley Shaft

Lubricant	Frequency	Qty
ISO 68 SAE 20W Bearing and Gear Lubricant	Every 8 Hours of Operation	2–3 Drops

Remove the spindle pulley shaft set screw shown in **Figure 81**, add 2–3 drops of lubricant, then re-install the set screw.

Feed Rate Gearbox Oil

Lubricant	Frequency	Qty
ISO 68 SAE 20W Bearing and Gear Lubricant	Every 8 Hours of Operation	2–3 Drops

Remove the oil plugs on either side of the control panel (see **Figure 82**), add 2–3 drops of lubricant, then replace the oil plugs.

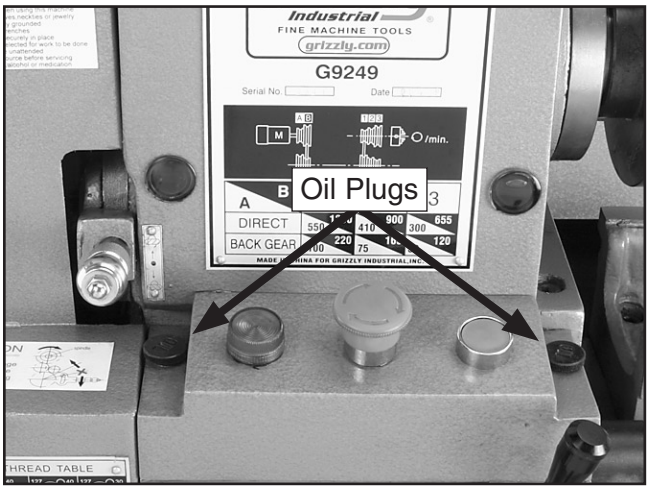


Figure 82. Feed rate gearbox oil plugs.

Feed Rate Gears

Lubricant	Frequency	Qty
Multi-Purpose Gear Grease	Every 40 Hours of Operation	As needed

To lubricate the feed rate gears:

1. Use a 5mm hex wrench to remove the four cap screws securing the feed rate gearbox cover (see **Figure 83**).

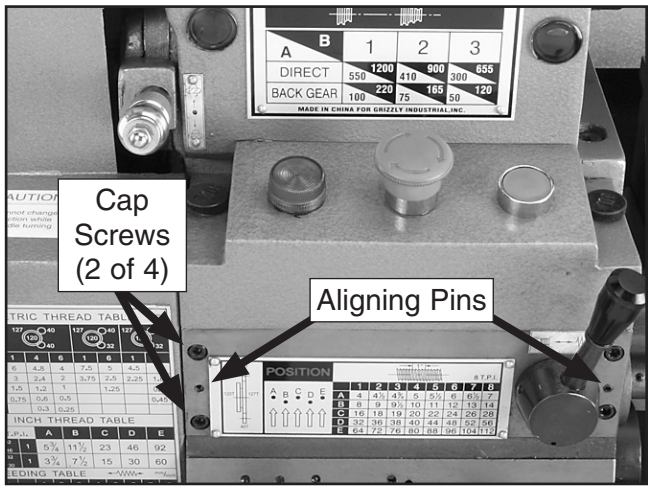


Figure 83. Feed rate gearbox cover.

2. Carefully pull the cover from the machine taking care not to bend the aligning pins.

3. Use a brush to apply a thin coat of grease to the gear teeth.

4. Use the aligning pins to properly position the cover on the machine, then secure it with the four cap screws.

Apron Gearbox

Lubricant	Frequency	Qty
ISO 68 SAE 20W Bearing and Gear Lubricant	Every 40 Hours of Operation	As needed

Remove the oil plug on top of the apron shown in **Figure 84**, add lubricant, then replace the oil plug. The apron gearbox reservoir holds approximately 3/4 of a pint of lubricant. Excess lubricant will leak from the front of the apron.

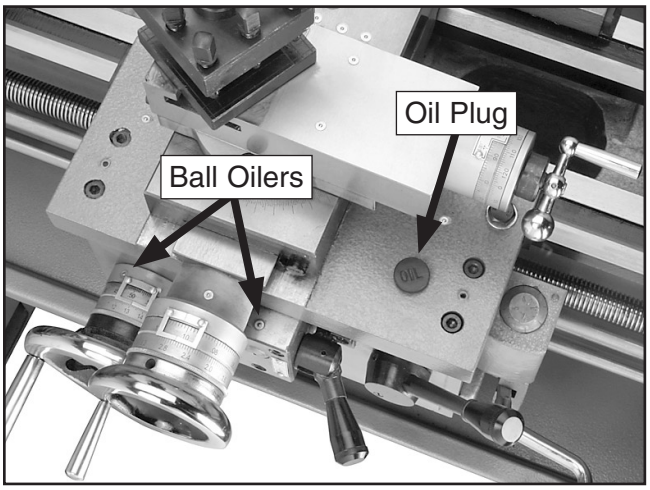


Figure 84. Apron lubrication points.

Ball Oilers

Lubricant	Frequency	Qty
ISO 68 SAE 20W Bearing and Gear Lubricant	Every 8 Hours of Operation	1 squirt from oil can

Wipe clean and lubricate the ball oilers shown in **Figures 85–88**. To insert the oil, depress the ball with the tip of an oil can and squirt once.

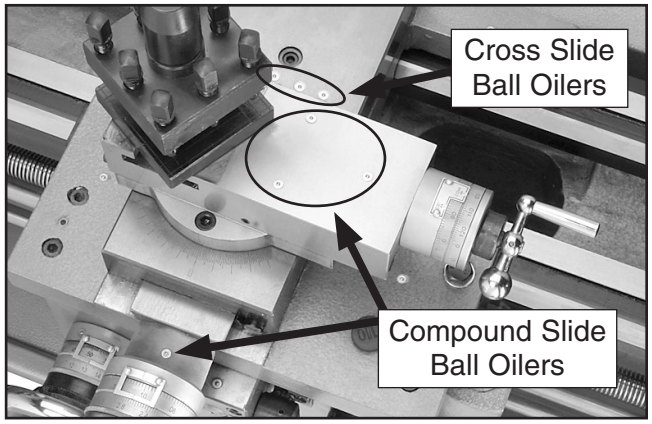


Figure 85. Cross and compound slide ball oilers (7 total).

Figure 86. Saddle way ball oilers (4 total).

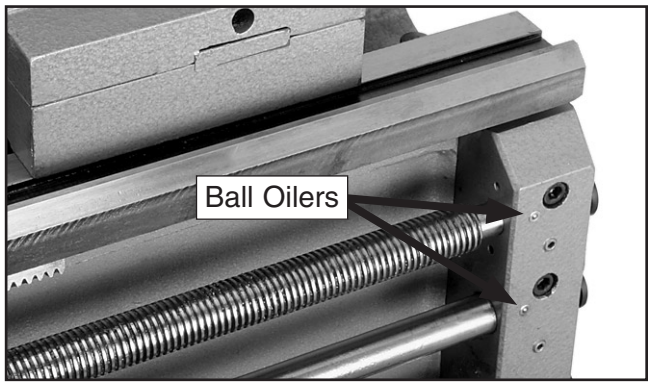


Figure 87. Leadscrew and feed rod ball oilers (2 total).

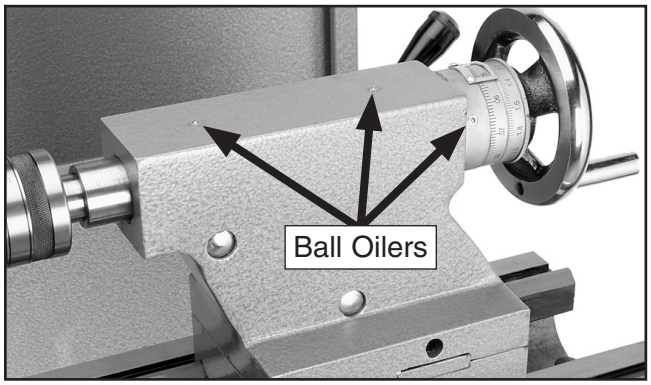


Figure 88. Tailstock ball oilers.

NOTICE

Follow reasonable lubrication practices as outlined in this manual for your lathe. Failure to do so could lead to premature failure of your lathe and will void the warranty.

Back Gear Shaft

Lubricant	Frequency	Qty
Multi-Purpose Gear Grease	Every 40 Hours of Operation	One Pump

Add one pump from a grease gun to the back gear shaft grease fitting shown in **Figure 89**.

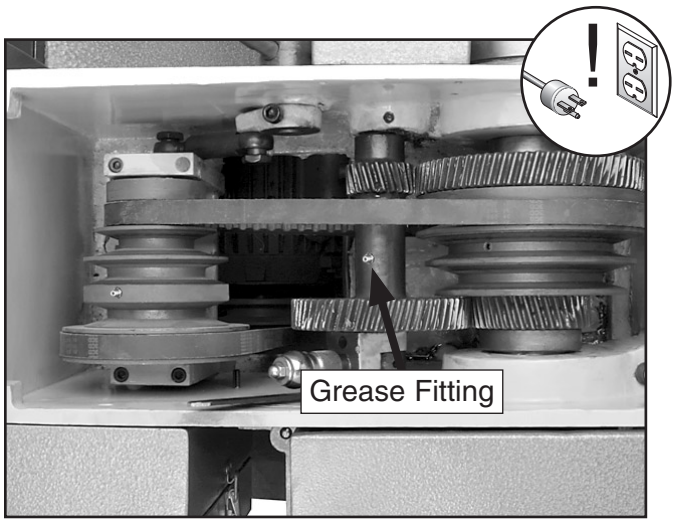


Figure 89. Back gear shaft grease fitting.

Tensioning/ Replacing V-Belts

Adjusting Motor V-Belt

Tools Needed **Qty**
Wrench 18mm 1

To adjust the motor V-belt tension:

1. DISCONNECT LATHE FROM POWER!

2. Push the belt tensioning lever back to tension both belts (see **Figure 90**).

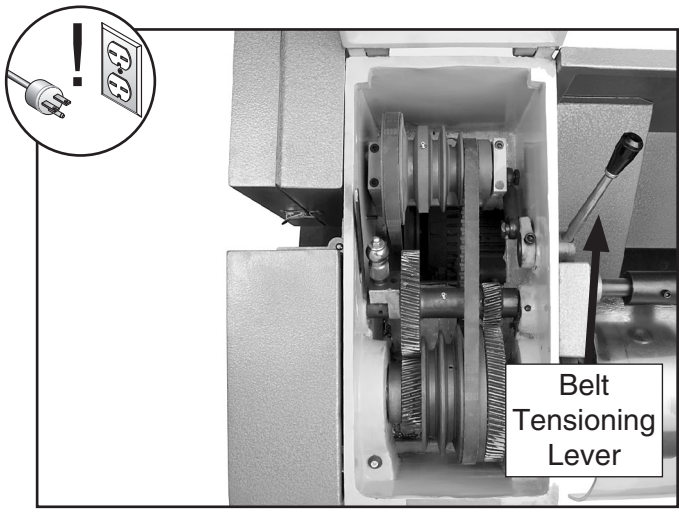


Figure 90. V-belt tensioning lever.

3. From the back of the lathe, check the motor V-belt deflection when moderate pressure is placed on the V-belt mid-way between the pulleys—it should be approximately ½" (see **Figure 91**).

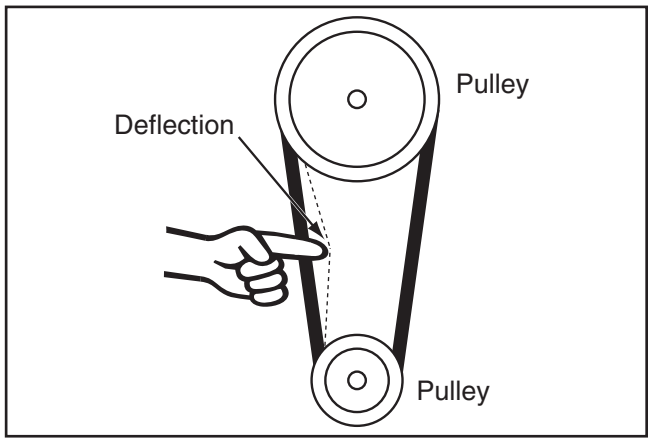


Figure 91. Checking motor V-belt tension.

4. To adjust the motor V-belt tension, loosen the jam nuts shown in **Figure 92**, then adjust the tensioning hex bolt to raise or lower the motor.

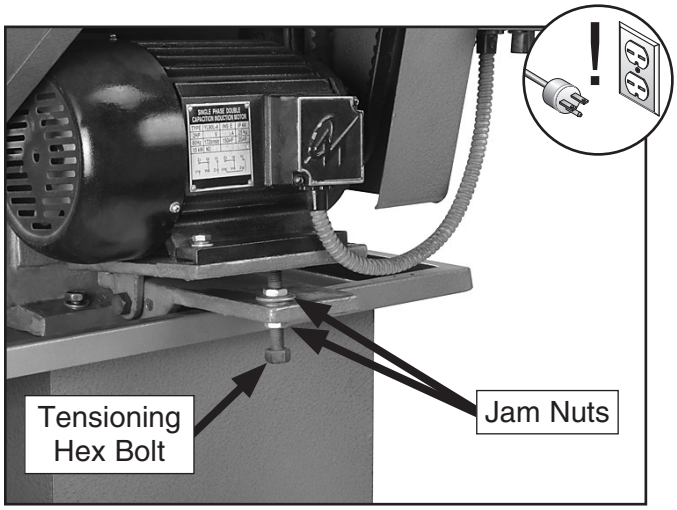


Figure 92. Motor V-belt tensioning hex bolt and jam nuts.

5. Re-check the V-belt deflection, and, when you are satisfied with the setting, re-tighten the jam nuts.

Replacing Motor V-Belt

Tools Needed **Qty**
Hex Wrench 5mm..... 1

To replace the motor V-belt:

1. DISCONNECT LATHE FROM POWER!

2. Pull the belt tensioning lever forward to release V-belt tension, then roll the motor V-belt off the motor pulley.

3. Raise the headstock cover.

4. Remove the two idler pulley shaft bearing caps shown in **Figure 93**.

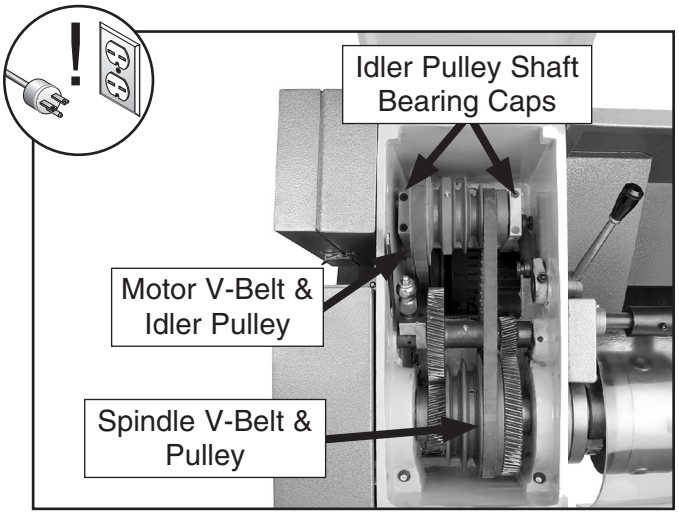


Figure 93. V-belts and pulleys.

5. Raise the idler pulley shaft until you can replace the V-belt with a new one, then lower the shaft onto the bottom bracket.

   Note: *Make sure the bearings on either side of the pulley shaft are correctly positioned on the bracket.*

6. Replace the bearing caps and re-tension the V-belt.

Spindle V-Belt

Proper tensioning of the spindle V-belt is automatically set when you push the belt tensioning lever back (see **Figure 90**).

To replace the spindle V-belt with a new one you must remove the spindle assembly from the lathe. This option is difficult and time consuming.

We recommend the alternative solution of just cutting the old V-belt to remove it, then replacing it with a Power Twist® V-Belt.

Power Twist® V-Belts
H9815—A ½" x 4'
H9816—3L ⅜" x 5'
H9817—B ⅝" x 6'
Perfect for lathes, table saws, bandsaws and other powered tools. Smooth running with less vibration than solid belts. Power Twist® V-Belts can be customized in minutes to any size—just add or remove sections to fit your needs. Carry a Power Twist® V-Belt in your vehicle for a fix anywhere solution to broken fan belts.

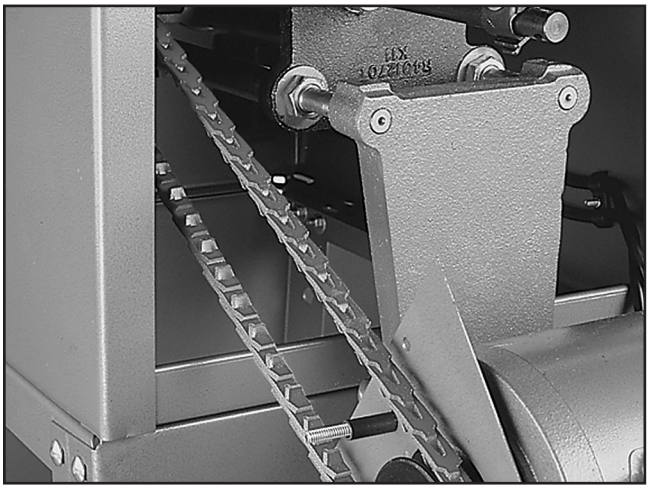


Figure 94. Power Twist® V-Belt.

SECTION 7: SERVICE

Review the troubleshooting and procedures in this section to fix or adjust your machine if a problem develops. If you need replacement parts or you are unsure of your repair skills, then feel free to call our Technical Support at (570) 546-9663.

Troubleshooting

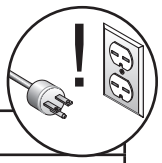
Motor & Electrical

Symptom	Possible Cause	Possible Solution
Machine does not start or a breaker trips.	1. Emergency stop button is engaged, or is at fault. 2. Change gear door, headstock cover, or chuck guard open tripping safety switch. 3. Plug or receptacle is at fault or wired incorrectly. 4. Start capacitor is at fault. 5. Contactor not getting energized or has burnt contacts. 6. Wall fuse or circuit breaker is blown or tripped. 7. Motor connection is wired incorrectly. 8. Power supply is at fault, or is switched OFF. 9. Motor ON button is at fault. 10. Centrifugal switch is at fault. 11. Spindle switch is at fault. 12. Cable or wiring is open or has high resistance. 13. Motor is at fault.	1. Rotate the emergency stop button clockwise until it pops out, or replace faulty emergency stop button. 2. Make sure the change gear door is closed and secure, the headstock cover is all the way down, and the chuck guard is in the proper operational position. 3. Test power plug and receptacle for good contact and correct wiring. 4. Test capacitor and replace if necessary. 5. Test for power in and out on all legs, and contactor operation; replace if faulty. 6. Make sure circuit breaker/fuse is sized correctly for machine load; replace faulty breaker. 7. Correct motor wiring (**Page 66**). 8. Make sure all hot lines and grounds are operational and have correct voltage. 9. Replace faulty motor ON button. 10. Adjust/replace. 11. Test; replace if necessary. 12. Troubleshoot wires for internal/external breaks; check for disconnected or corroded connections; repair or replace faulty wiring or connections. 13. Test/repair/replace.
Machine has vibration or noisy operation.	1. Motor or component is loose. 2. V-belt(s) worn, damaged, or loose. 3. Motor fan is rubbing on fan cover. 4. Pulley set screws or keys are missing or loose. 5. Machine is incorrectly mounted to floor. 6. Cutting tool is chattering. 7. Workpiece or chuck is at fault. 8. Spindle bearings are at fault. 9. Motor bearings are at fault. 10. Gears are at fault.	1. Inspect/replace stripped or damaged fasteners; re-tighten with thread locking fluid. 2. Replace/re-tension V-belts (**Page 51**). 3. Repair/replace dented fan cover or fan. 4. Inspect set screws/keys; replace/tighten if necessary. 5. Re-tighten/replace machine mounting hardware as necessary; use shims where required. 6. Re-sharpen/replace cutting tool; index tool to workpiece; use correct feed rate and spindle speed. 7. Re-center and properly secure workpiece in chuck or faceplate; replace defective chuck/faceplate. 8. Tighten/replace spindle bearings. 9. Rotate motor shaft to check for noisy or burnt bearing; repair/replace as necessary. 10. Replace bad gears/bearings.

Motor & Electrical (continued)

Symptom	Possible Cause	Possible Solution
Machine stalls or is overloaded.	1. Wrong workpiece material.	1. Only process metal that has the correct properties for your type of machining.
	2. Workpiece alignment is at fault.	2. Re-center and properly secure workpiece in chuck or faceplate.
	3. Incorrect spindle speed for task.	3. Correctly set V-belts and gearing for your operation (**Page 51**).
	4. Low power supply.	4. Make sure all hot lines and grounds are operational and have correct voltage.
	5. Run capacitor is at fault.	5. Test and replace if necessary.
	6. V-belt(s) is slipping.	6. Check V-belts and re-tension; replace if necessary (**Page 51**).
	7. Plug or receptacle is at fault.	7. Test power plug and receptacle for good contact and correct wiring.
	8. Motor connection is wired incorrectly.	8. Correct motor wiring (**Page 66**).
	9. Motor bearings are at fault.	9. Rotate motor shaft to check for noisy or burnt bearing; repair/replace as necessary.
	10. Machine is undersized for the task.	10. Use sharp cutting tools at the correct angle, reduce feed rate or depth of cut, and use coolant if possible.
	11. Motor has overheated.	11. Clear obstacles away from the motor fan cover, let motor cool, and reduce workload on machine.
	12. Spindle switch is at fault.	12. Test; replace if necessary.
	13. Motor is at fault.	13. Test/repair/replace.
	14. Centrifugal switch is at fault.	14. Adjust/replace.

Operations



Symptom	Possible Cause	Possible Solution
Bad surface finish.	1. Incorrect spindle speed or feed rate. 2. Dull tool or poor tool selection. 3. Too much play in gibs. 4. Tool too high.	1. Adjust for proper spindle speed and feed rate (**Page 34**). 2. Use sharp tools; use correct tool for the operation. 3. Adjust gibs (**Page 56**). 4. Lower tool position.
Cannot remove tapered tool from tailstock quill.	1. Quill not retracted all the way back into the tailstock. 2. Debris/oil not removed from tapered mating surfaces before inserting into quill.	1. Rotate the quill handwheel until the tapered tool is forced out of quill. 2. Always make sure that tapered mating surfaces are clean before inserting.
Gear(s) will not line up and mesh.	1. Gear(s) not aligned in headstock.	1. Rotate spindle by hand until gear(s) falls into place.
Cutting tool or machine components vibrate excessively during cutting.	1. Tool holder not tight enough. 2. Cutting tool too far out from holder; lack of support. 3. Too much play in gibs. 4. Cutting tool is dull. 5. Incorrect spindle speed or feed rate.	1. Check for debris, clean, and re-tighten. 2. Re-install cutting tool with no more than ⅓ of total length is sticking out of tool holder. 3. Adjust gibs (**Page 56**). 4. Sharpen/replace. 5. Adjust for proper spindle speed and feed rate (**Page 34**).
Cross/compound slide or carriage feed has sloppy operation.	1. Too much play in gibs. 2. Handwheel(s) loose. 3. Too much leadscrew backlash (cross slide only). 4. Leadscrew mechanism worn or out of adjustment.	1. Adjust gibs (**Page 56**). 2. Tighten handwheel fasteners. 3. Adjust leadscrew backlash (**Page 57**). 4. Tighten any loose fasteners on leadscrew mechanisms; check for excessive wear/replace if necessary.
Cross/compound slide or carriage feed hard to move.	1. Gibs are loaded up with chips/grime. 2. Gibs are too tight. 3. Leadscrew backlash setting too tight (cross slide only). 4. Bedways are dirty/dry. 5. Gearing is at fault.	1. Remove gibs, clean ways, lubricate, and properly adjust gibs (**Page 56**). 2. Adjust gibs (**Page 56**). 3. Properly adjust cross slide leadscrew backlash (**Page 57**). 4. Clean and lubricate bedways. 5. Inspect/replace gearing.
Inaccurate turning results from one end of workpiece to the other.	1. Tailstock not properly aligned with headstock.	1. Properly align tailstock with headstock (**Page 28**).
Chuck jaws will not move or do not move easily.	1. Chips/debris lodged in jaws.	1. Remove jaws, clean and lubricate jaws, scroll-gear threads, and chuck, then replace jaws.
Tailstock quill will not feed out of tailstock.	1. Quill lock is tightened down.	1. Turn quill lock counterclockwise to loosen.

Adjusting Gibs

Gibs control the accuracy of the carriage, cross slide, and compound slide movements along the ways. Tight gibs make the movements more accurate, but harder to perform. Loose gibs make the movements sloppy, but easier to perform. The goal of gib adjustment is to remove unnecessary sloppiness without causing the ways to bind.

NOTICE

Excessively loose gibs may cause poor workpiece finishes, and may cause undue wear of sliding surfaces and ways. Over-tightening the gibs may cause premature wear of these sliding devices.

Tools Needed	Qty
Hex Wrench 6mm	1
Wrench 14mm	1

To adjust the saddle gib:

1. DISCONNECT LATHE FROM POWER!

2. Loosen the three hex nuts one full turn (see **Figure 95**).

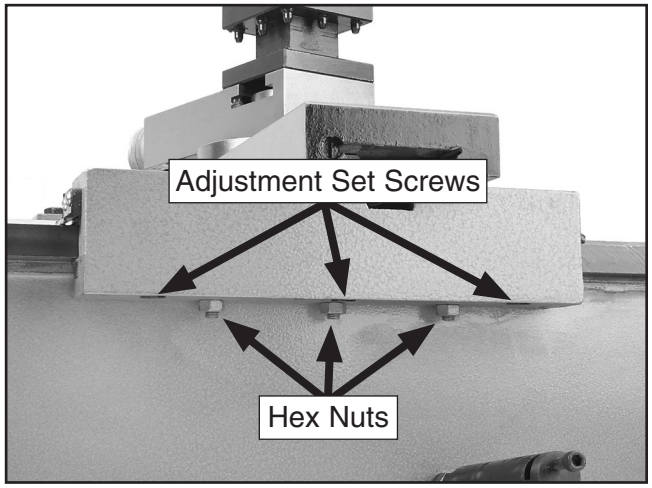


Figure 95. Gib adjustment set screws and hex nuts (shown from rear of saddle).

3. Loosen the three gib adjustment set screws a full turn, then re-tighten each one until you feel a slight resistance.

4. Manually test the carriage movement and re-adjust the set screws if necessary.

5. When you are satisfied with the carriage movement, re-tighten the three hex nuts. DO NOT over-tighten.

Tools Needed	Qty
Standard Screwdriver	1

To adjust the cross slide and compound slide gibs:

1. DISCONNECT LATHE FROM POWER!

2. Loosen the rear gib adjustment screw a small amount, then tighten the front gib adjustment screw the same amount (see **Figures 96–97**).

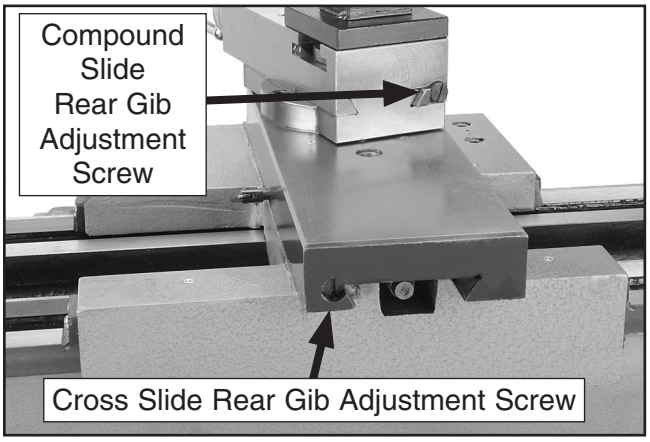


Figure 96. Cross and compound slide rear gib adjustment screws.

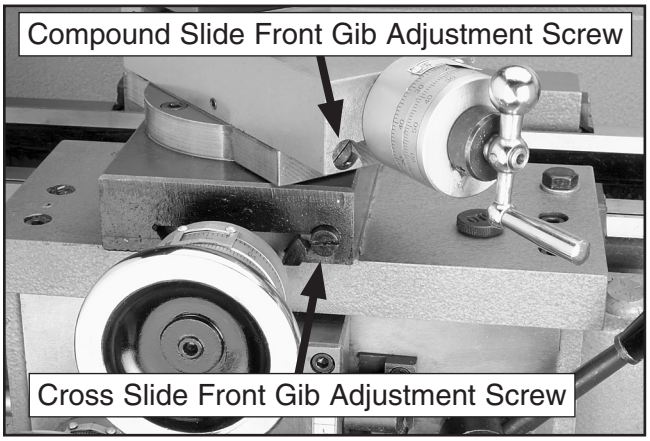


Figure 97. Cross and compound slide front gib adjustment screws.

3. Use the handwheels to test the slide movement and repeat **Step 2** if necessary.

   Note: *Adjust gib pressure until you feel a slight drag in the movement of the slide.*

Tailstock Lock

When pushed toward the spindle, the tailstock lock holds the tailstock firmly in place on the bedway with a locking plate underneath the tailstock.

Tools Needed **Qty**
Wrench 18mm 1

To adjust the tailstock lock:

1. Move the tailstock lock down, then position the tailstock to an area on the bedway that will allow access to the locking hex nut and plate underneath the tailstock (see **Figure 98**).

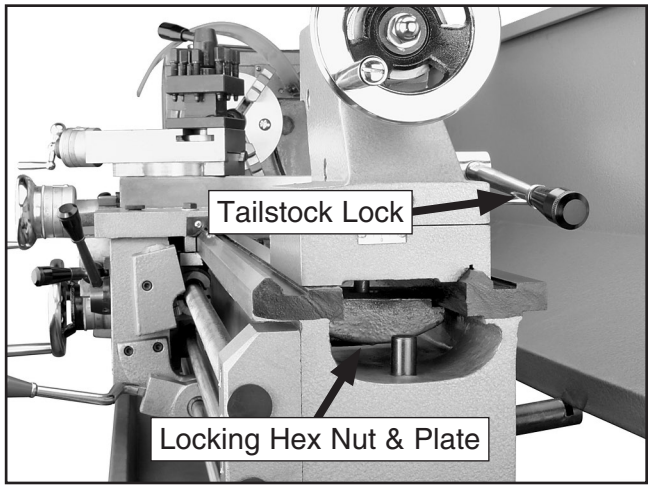


Figure 98. Tailstock locking hex nut and plate.

2. Tighten the locking hex nut a 1/4 turn at a time until the tailstock will not move when locked. Repeat this step as necessary.

Cross Slide Backlash

Backlash is the amount of play in the handwheel, felt when turning the handwheel, but before the slide begins to move.

Note: *When adjusting backlash, keep in mind the goal is to tighten the cross slide leadscrew without causing it to bind. Overtightening will cause excessive wear to the sliding block and leadscrew.*

To adjust the cross slide backlash:

1. DISCONNECT LATHE FROM POWER!

2. Remove the rear splash pan from the lathe.

3. From the rear of the cross slide, loosen/tighten the two Phillips head screws shown in **Figure 99** until you are satisfied with the amount of backlash.

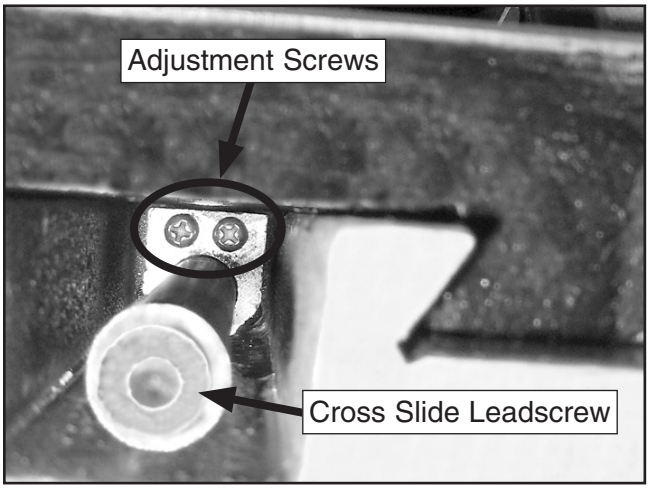


Figure 99. Cross slide backlash adjustment screws (viewed from the rear of the cross slide).

4. Re-install the rear splash pan.

Gap Removal

The Model G9249 comes equipped with a gap section below the spindle that can be removed for turning large diameter parts or when using a large diameter faceplate.

The gap is installed, then ground, at the factory during lathe assembly for precise fit and alignment. Factors during the remaining assembly apply additional forces to the gap making the replacement of the gap to the original position very difficult. **If you choose to remove the gap, we do not recommend attempting to replace it.**

Tools Needed	Qty
Hex Wrench 8mm	1
Wrench 12mm	1
Dead Blow Hammer	1

To remove the gap:

1. DISCONNECT LATHE FROM POWER!

2. To release the taper pins from the gap, slowly tighten the taper pin hex nuts (see **Figure 100**), then remove the pins.

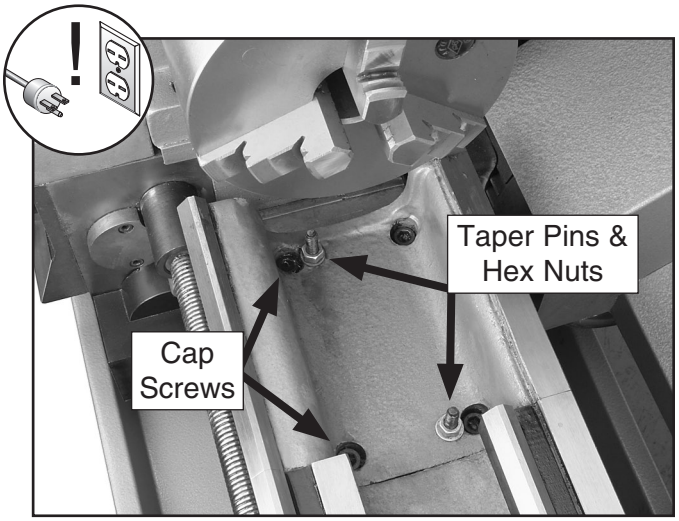


Figure 100. Gap taper pins and cap screws.

3. Remove the four cap screws.

4. Tap the outside of the gap with a dead blow hammer to loosen it, then remove the gap from the lathe.

Spindle Bearing Preload

The Model G9249 is shipped from the factory with the spindle bearing preload properly adjusted. However, if the spindle ever develops enough end-play that the workpiece finish suffers, you can adjust the bearing preload to remove the end-play.

Adjusting the spindle bearing preload requires using a spanner wrench or a punch and hammer. You can either purchase the spanner wrench at a tool store or fabricate one using the diagram shown in **Figure 101**.

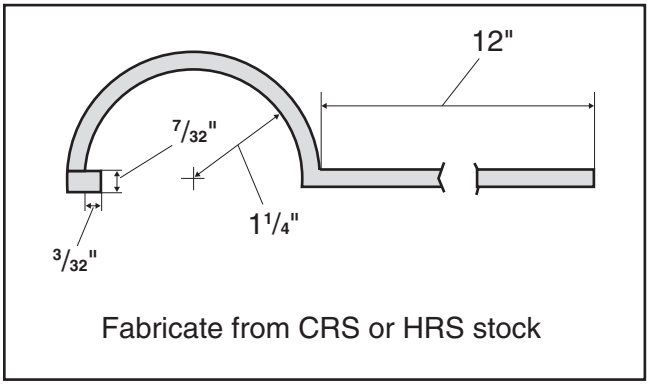


Figure 101. Spanner wrench dimensions.

NOTICE

To fully understand the process of preloading the spindle bearings, read this entire subsection before performing any of the steps.

Tools Needed	Qty
Hex Wrench 5mm	1
Hex Wrench 8mm	1
Spanner Wrench, or Hammer and Punch	1
Test Indicator	1
Small Sledge or Heavy Dead Blow Hammer	1
Wooden Block	1

To adjust the spindle bearing preload:

1. Run the lathe for 20 minutes on a high speed to bring the lathe to a normal operating temperature.

2. DISCONNECT LATHE FROM POWER!

3. Remove the chuck or faceplate and the change gear door.

4. Engage a feed direction gear with the outbound spindle gear to keep the spindle from turning.

5. Using a spanner wrench or a hammer and punch, loosen and remove the outer spanner nut (see **Figure 102**).

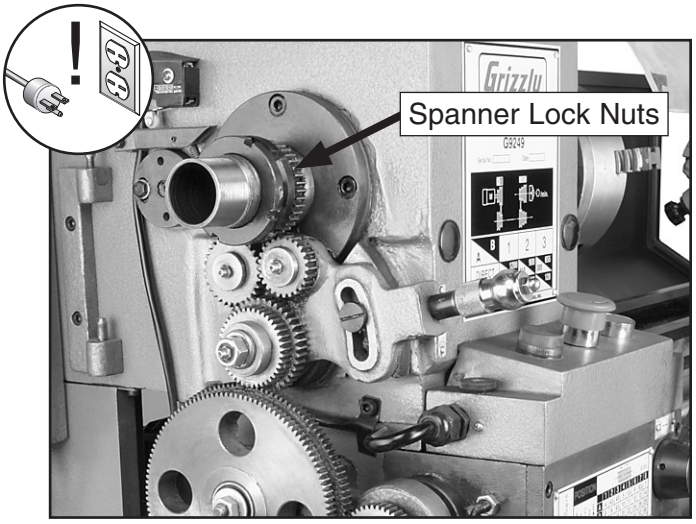


Figure 102. Spindle spanner nuts.

6. Loosen the inner spanner nut one turn.

Note: *You may have to tap on the outboard spindle tube, as explained in **Step 7**, to help unload the spindle and break the inner spanner nut loose.*

7. Place a wooden block over the outboard end of the spindle tube (see **Figure 103** for an example) and hit it soundly with a small sledge or heavy dead blow hammer.

Note: *Your goal is slide the spindle forward just enough to introduce spindle end-play that you can feel by hand.*

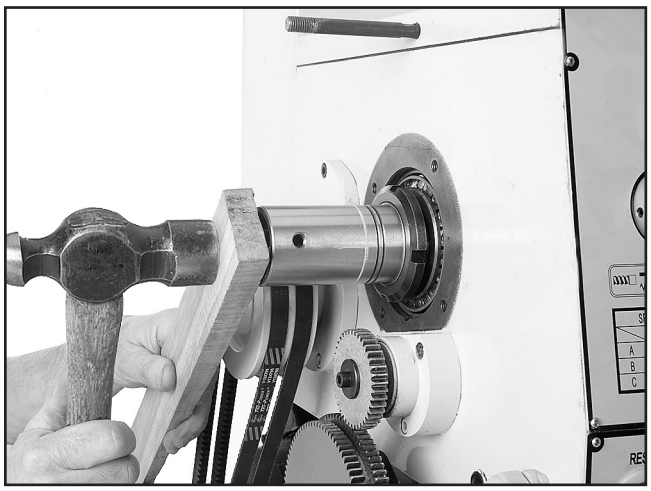


Figure 103. Example of introducing detectable end-play.

8. Place a test indicator on the cross slide and move the carriage toward the headstock until the contact point of the indicator touches the rim of the spindle tube (see **Figure 104** for an example).

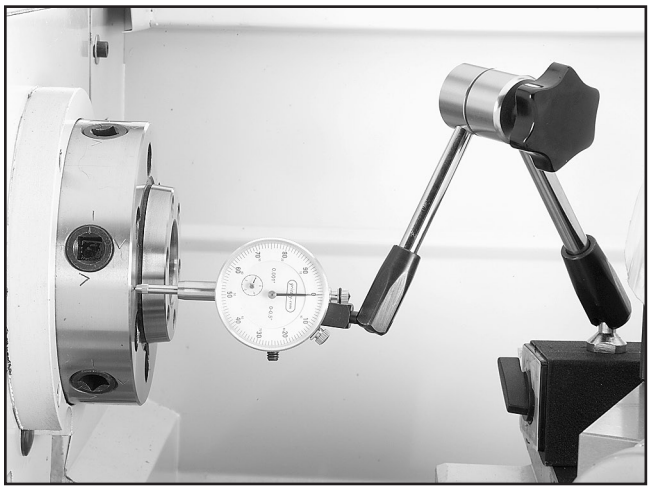


Figure 104. Example of test indicator setup.

9. Move the carriage toward the spindle an additional 0.100".

10. Tighten the inner spanner nut until you see the motion of the dial indicator needle just barely stop moving. During the spanner nut tightening process, rock the spindle back and forth slightly to make sure the spindle bearings seat properly in the races.

Note: *When the dial indicator needle stops moving, there will be no spindle end-play and no bearing preload. It is essential that you find this exact point without tightening the inner spanner nut too much and inadvertently preload the spindle bearings.*

Since it can take great effort to turn the inner spanner nut, you may find it difficult to know if you have gone past the zero end-play point or not. You may find it easier to have an assistant watch the dial for you while you tighten the spanner nut. If you think you may have gone past the zero end-play point, take the time to unload the bearings as described in earlier steps, then re-tighten the spanner nut until you know you have reached the correct setting.

11. To set the correct amount of spindle bearing preload, rotate the inner spindle lock nut clockwise an additional 0.13" along its circumference. See **Figure 105** for an example of this measurement.

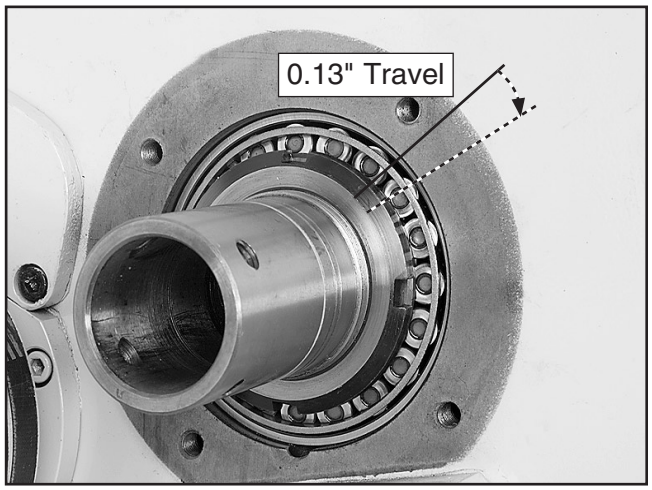


Figure 105. Example of final inner spanner nut travel.

12. Without causing the inner spanner nut to tighten any further, install and tighten the outer spanner nut against the inner nut.

Note: *Do not overtighten the outer spanner nut because additional preload can force the bearings even tighter against the races in the headstock and cause the headstock to compress or crack, or cause bearing failure.*

13. Re-install the change gear door.

To confirm that the bearings are correctly preloaded:

1. Make sure all safety precautions have been taken and setup steps are complete to make the lathe fully operational.

2. Remove all tools and materials used during the bearing preload process.

3. Set the spindle speed to its highest setting.

4. Connect the lathe to power and turn it ***ON***.

5. Let the lathe run for 20 minutes.

6. Turn the spindle ***OFF***, disconnect the lathe from power, and check the temperature of the spindle.

—If the inboard end of the spindle tube is slightly warm to the touch, you have the correct bearing preload.

—If the inboard end of the spindle tube is hotter than you can comfortably keep your hand on, the preload is too tight and you must repeat the spindle bearing preload adjustment procedure.

Rest Finger Tips

Type of Finger Tip	Part Number
Steady Rest	P9249706
Follow Rest	P9249806

The steady rest and follow rest fingers can be easily removed for repairing or replacing the brass tips. To order replacement tips, call Grizzly at 1-800-523-4777 and order the appropriate part number indicated above.

To remove/install the rest fingers:

1. Loosen the jam nut and set screw shown in **Figure 106**.

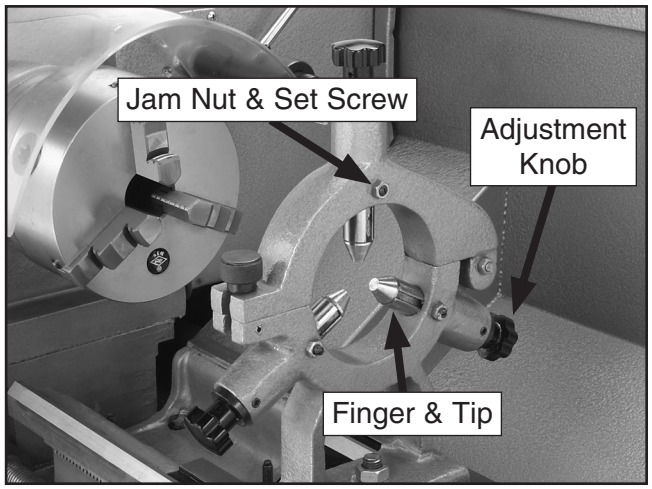


Figure 106. Rest fingers and tips.

2. Hold the finger with one hand, then rotate the adjustment knob until the finger is free of the rest.
3. To re-install the finger, align the finger keyway with the set screw, slide the finger into the rest, then tighten the adjustment knob to hold the finger in place.

To remove/install the brass tips:

1. Protect the finger and secure it in a vise.
2. Place a punch through the top end of the finger, then use a hammer to tap the brass tip loose from the finger.
3. To re-install the brass tip, turn the finger upside down in the vise, position the brass tip over the hole, then use a dead blow hammer to tap the tip in place.

Adjusting Half-Nut

The half-nut should engage the leadscrew firmly without tilting from side-to-side during operation. With normal wear over an extended period of use of the half-nut, adjustment of the half-nut guide bar may be necessary.

The goal of adjusting the half-nut guide bar is remove excessive play so that the half-nut easily and firmly engages the leadscrew, but will not tilt from side-to-side when the carriage is moved back and forth.

Tools Needed	**Qty**
Hex Wrench 3mm	1
Hex Wrench 5mm	1

To adjust the half-nut guide bar:

1. DISCONNECT LATHE FROM POWER!

2. Unscrew the cap screw shown in **Figure 107** and remove the thread dial assembly.

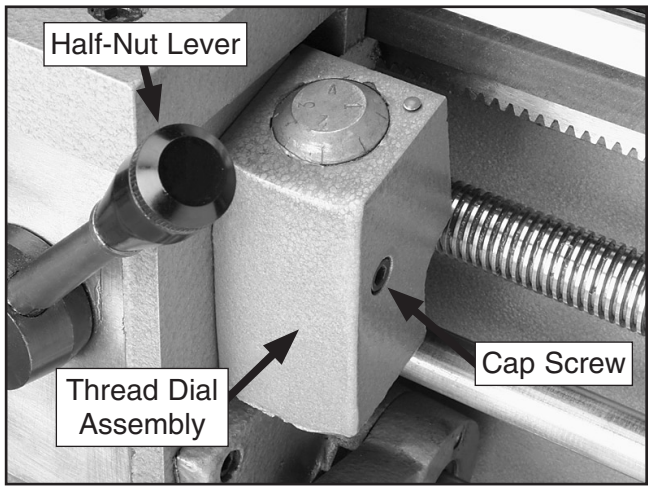


Figure 107. Thread dial and cap screw.

3. Loosen the two set screws shown in **Figure 108** one full turn.

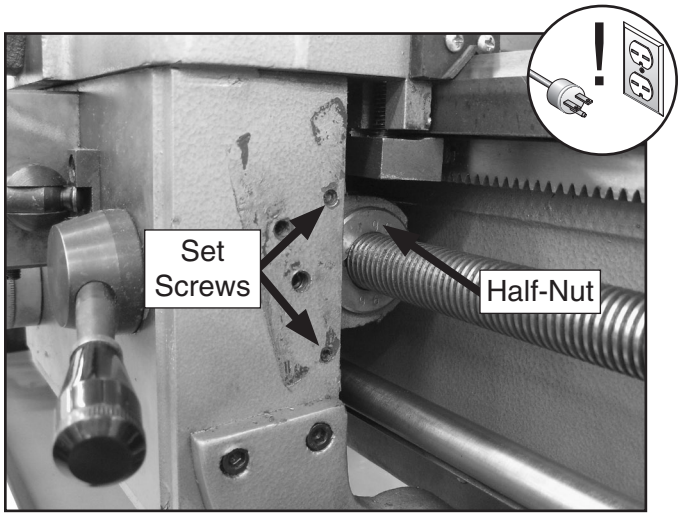


Figure 108. Half-nut guide bar set screws.

4. Use the half-nut lever to engage the half-nut with the leadscrew, then rotate the carriage handwheel back and forth.

Note: *During this step, observe how the half-nut tilts from side-to-side on the leadscrew.*

5. Evenly tighten the set screws until a slight resistance is felt.

6. Repeat **Steps 4–5** until the set screws are just snug—DO NOT overtighten them.

7. Re-install the thread dial.

SECTION 8: WIRING

⚠WARNING
Electrical Safety Instructions

1. **PRINTED INFORMATION.** The electrical information included in this section is current at the time of printing. However, in the spirit of improvement, we may make changes to the electrical system of future machines. Study the photos and diagrams in this section carefully. If you notice differences between your machine and these diagrams, call Technical Support at (570) 546-9663 for assistance.

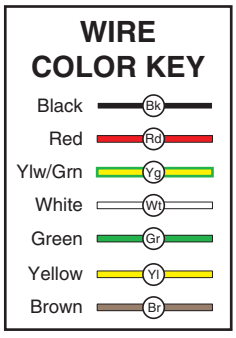
2. **SHOCK HAZARD.** Disconnect power from the machine before servicing electrical components. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death.

3. **GROUNDED CIRCUIT.** Electrocution or fire could result if the machine is not grounded and installed in compliance with electrical codes. Compliance MUST be verified by a qualified electrician.

4. **CIRCUIT REQUIREMENTS.** You MUST follow the **CIRCUIT REQUIREMENTS** section on **Page 10**. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**

5. **MOTOR WIRING.** The motor wiring shown in these diagrams are current at the time of printing, but it may not match your machine. Always use the wiring diagram inside the motor junction box.

6. **EXPERIENCING DIFFICULTIES.** If at any time you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (570) 546-9663.



View these electrical pages in color at *www.grizzly.com*.

Wiring Overview

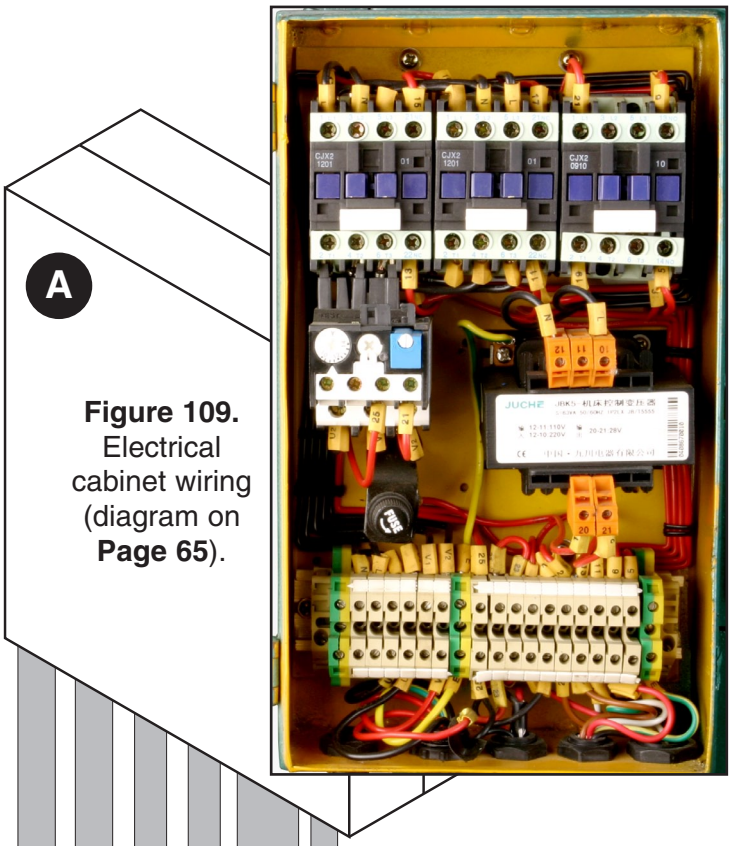
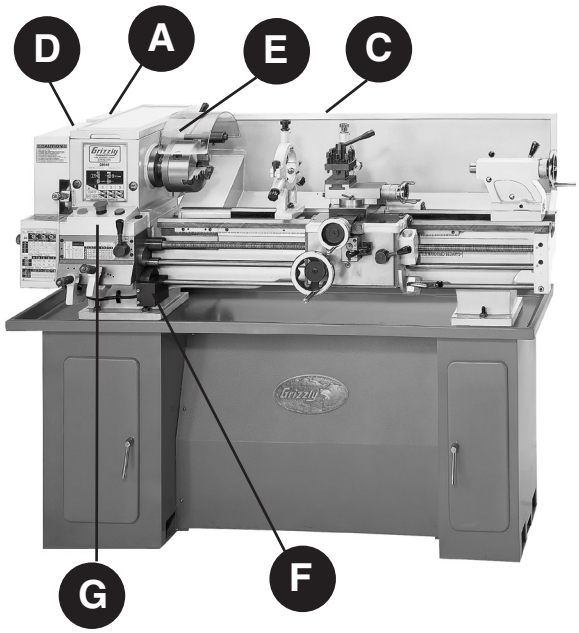
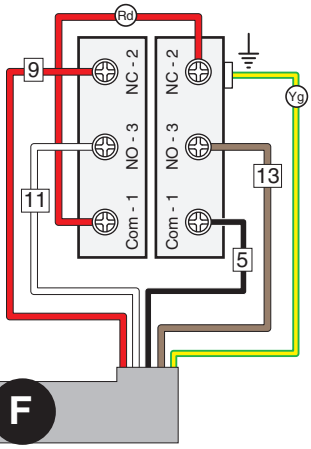


Figure 109. Electrical cabinet wiring (diagram on **Page 65**).





Control Panel
Diagram on **Page 66**

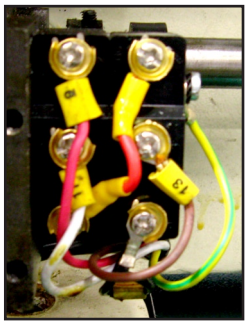
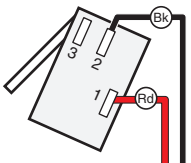


Figure 110. Spindle switch wiring.



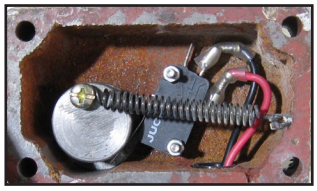
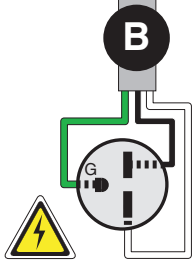
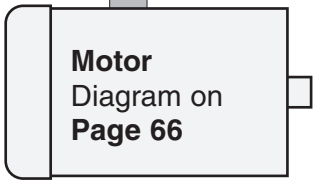
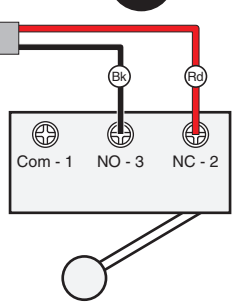


Figure 111. Chuck guard safety switch wiring.



NEMA 6-15 Plug
(As Recommended)





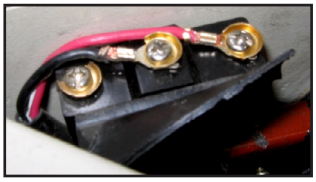
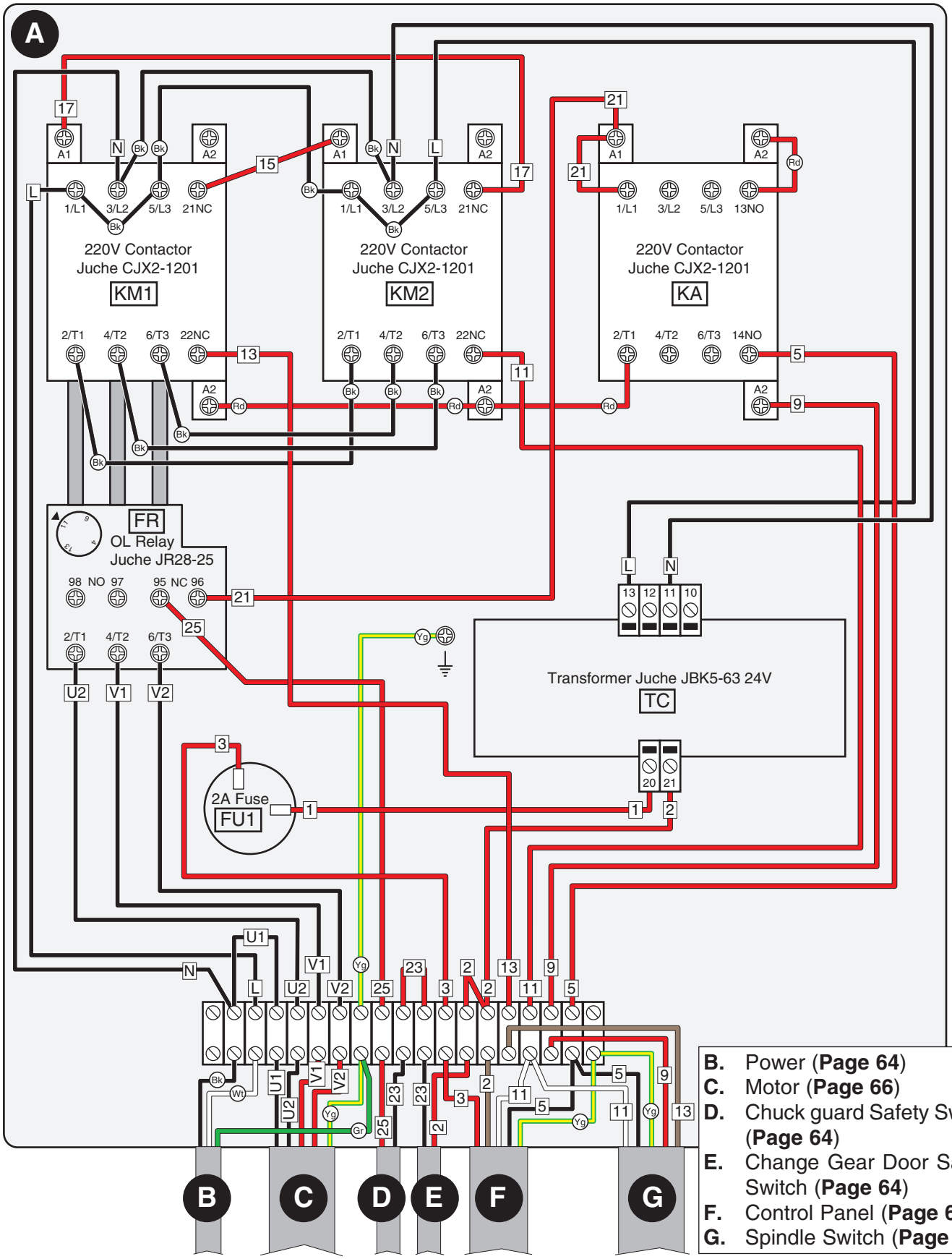


Figure 112. Change gear door safety switch wiring.

You MUST read and understand the Electrical Safety Instructions on Page 63.

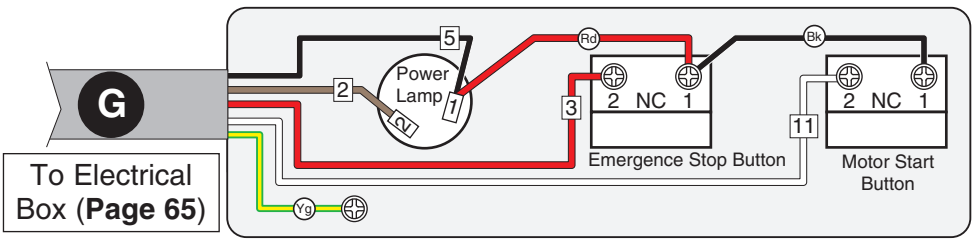
Electrical Cabinet Wiring Diagram



B. Power (**Page 64**)
C. Motor (**Page 66**)
D. Chuck guard Safety Switch (**Page 64**)
E. Change Gear Door Safety Switch (**Page 64**)
F. Control Panel (**Page 66**)
G. Spindle Switch (**Page 64**)

Control Panel & Motor Wiring Diagrams

Control Panel



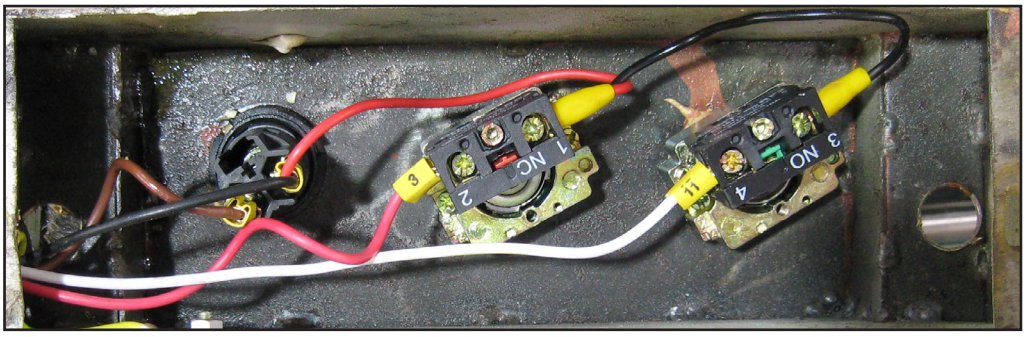
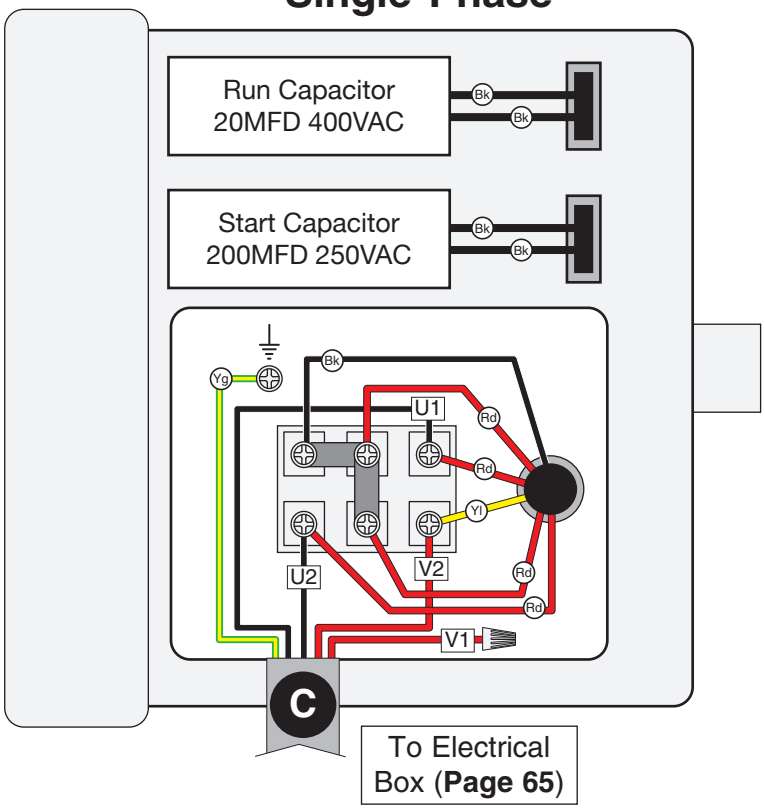


Figure 113. Control panel wiring.

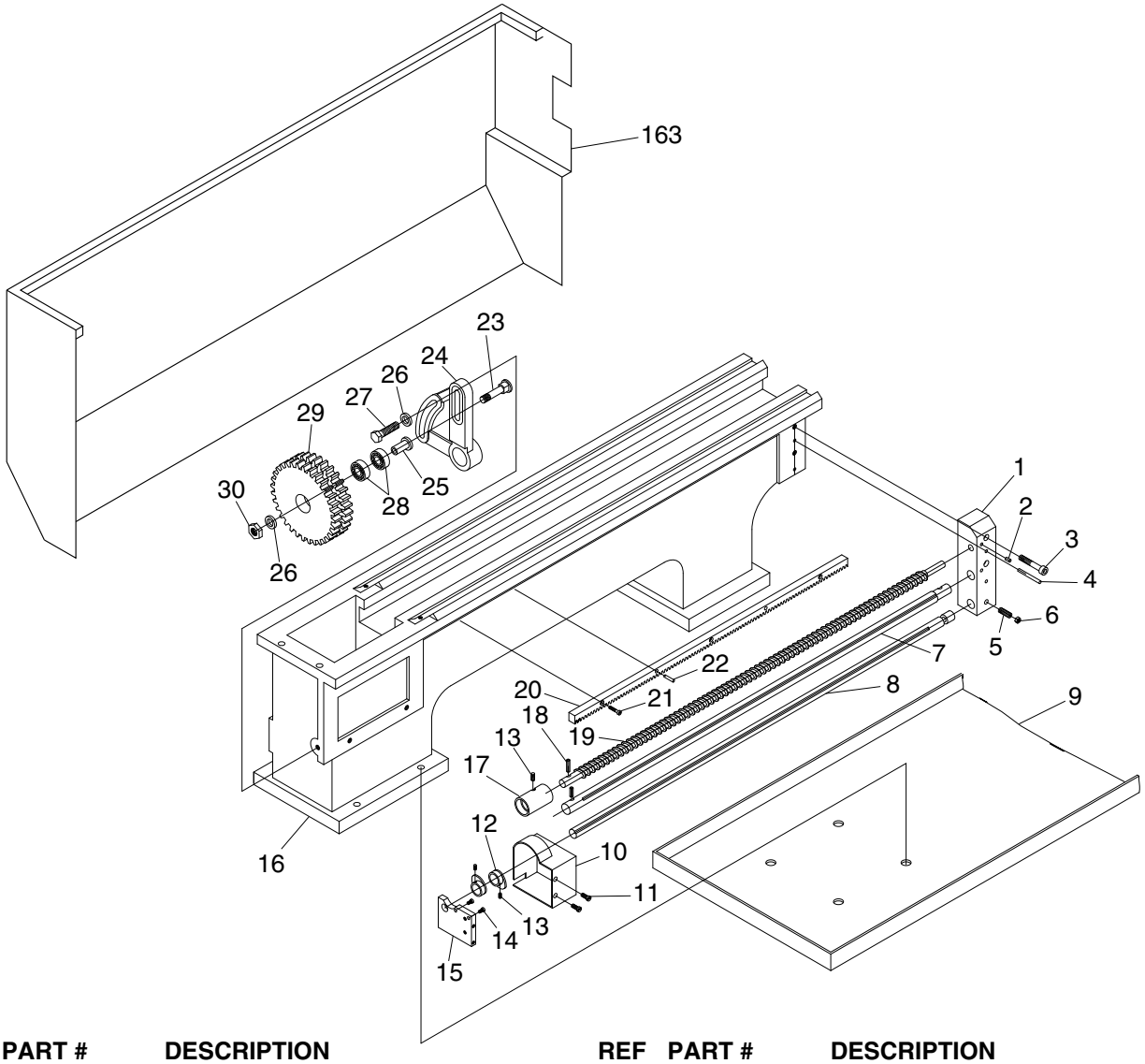
Figure 114. Motor wiring.

Motor 2HP 220V 60Hz Single-Phase



SECTION 9: PARTS

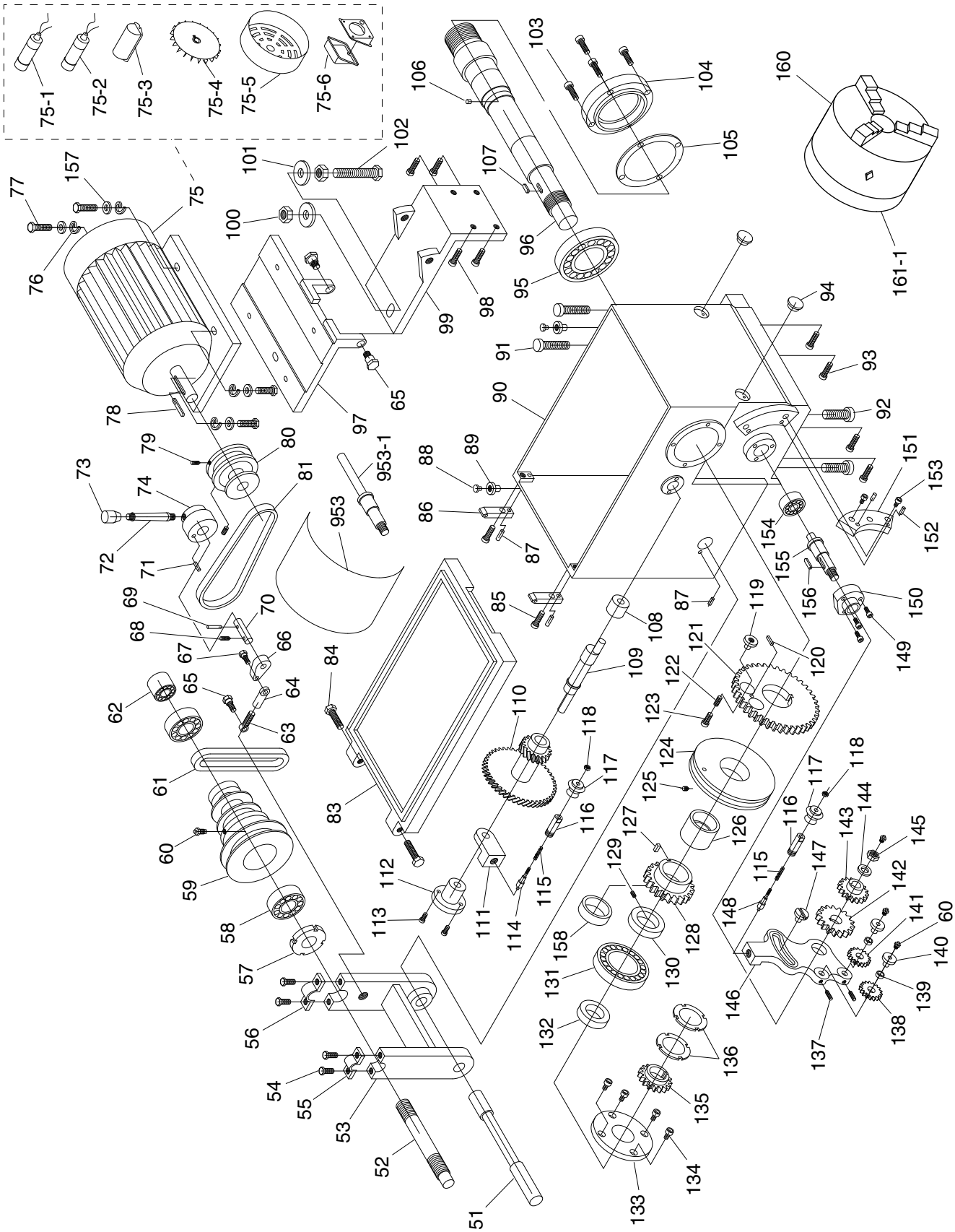
Bed



REF	PART #	DESCRIPTION
1	P9249001	ROD END CAP
2	P9249002	BALL OILER
3	PSB05M	CAP SCREW M8-1.25 X 50
4	PRP30M	ROLL PIN 5 X 50
5	PSS09M	SET SCREW M8-1.25 X 20
6	PN03M	HEX NUT M8-1.25
7	P9249007	FEED ROD
8	P9249008	SPINDLE DIRECTION ROD
9	P9249009	CHIP PAN
10	P9249010	SWITCH COVER
11	PS14M	PHLP HD SCR M6-1 X 12
12	P9249012	ECCENTRIC BRACKET
13	PSS02M	SET SCREW M6-1 X 6
14	PSB26M	CAP SCREW M6-1 X 12
15	P9249015	SWITCH BRACKET
16	P9249016	BED

REF	PART #	DESCRIPTION
17	P9249017	LEADSCREW BUSHING
18	PRP05M	ROLL PIN 5 X 30
19	P9249019	CARRIAGE LEADSCREW
20	P9249020	RACK
21	PSB02M	CAP SCREW M6-1 X 20
22	PRP05M	ROLL PIN 5 X 30
23	P9249023	SHAFT
24	P9249024	BRACKET
25	P9249025	BEARING SLEEVE
26	PW04M	FLAT WASHER 10MM
27	PB31M	HEX BOLT M10-1.5 x 40
28	P6003	BALL BEARING 6003ZZ
29	P9249029	CHANGE GEAR 120/127T
30	P9249030	SPECIAL NUT M10-1.5
163	P9249163	BACKSPLASH

Headstock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Headstock Parts List

REF	PART #	DESCRIPTION
51	P9249051	BRACKET AXLE
52	P9249052	IDLER PULLEY SHAFT
53	P9249053	IDLER BRACKET
54	PB107M	HEX BOLT M5-.8 X 12
55	P9249055	BRACKET CAP SMALL
56	P9249056	BRACKET CAP LARGE
57	P9249057	SPANNER NUT M10-1.0
58	P6005	BALL BEARING 6005ZZ
59	P9249059	IDLER PULLEY
60	P9249002	BALL OILER
61	PVB38	V-BELT B-38 5L380
62	P9249062	SPECIAL LOCK NUT
63	P9249063	SPECIAL BOLT M5-.8 X 20
64	P9249064	ADJUSTABLE NUT M5-.8
65	P9249065	SPECIAL BOLT M5-.8 X 16
66	P9249066	ECCENTRIC ARM
67	PB95M	HEX BOLT M5-.8 X 16
68	PSS14M	SET SCREW M8-1.25 X 12
69	PRP28M	ROLL PIN 5 X 40
70	P9249070	SHAFT
71	PRP94M	ROLL PIN 5 X 14
72	P9249072	HANDLE
73	P9249073	KNOB M10-1.5 X 50
74	P9249074	HANDLE HUB
75	P9249075	MOTOR 2HP 220V 60HZ 1PH
75-1	PC200A	S CAPACITOR 200M 250V 1-3/8 X 2-3/4
75-2	PC20A	R CAPACITOR 20M 400V 1-5/8 X 2-3/4
75-3	P9249075-3	CAPACITOR COVER
75-4	P9249075-4	MOTOR FAN
75-5	P9249075-5	MOTOR FAN COVER
75-6	P9249075-6	MOTOR WIRING JUNCTION BOX
76	PLW04M	LOCK WASHER 8MM
77	PB07M	HEX BOLT M8-1.25 X 25
78	PK142M	KEY 6 X 6 X 32
79	PSS06M	SET SCREW M8-1.25 X 16
80	P9249080	MOTOR PULLEY
81	P9249081	V-BELT B-813
83	P9249083	GEARBOX COVER
84	PB20M	HEX BOLT M8-1.25 X 35
85	PSB14M	CAP SCREW M8-1.25 X 20

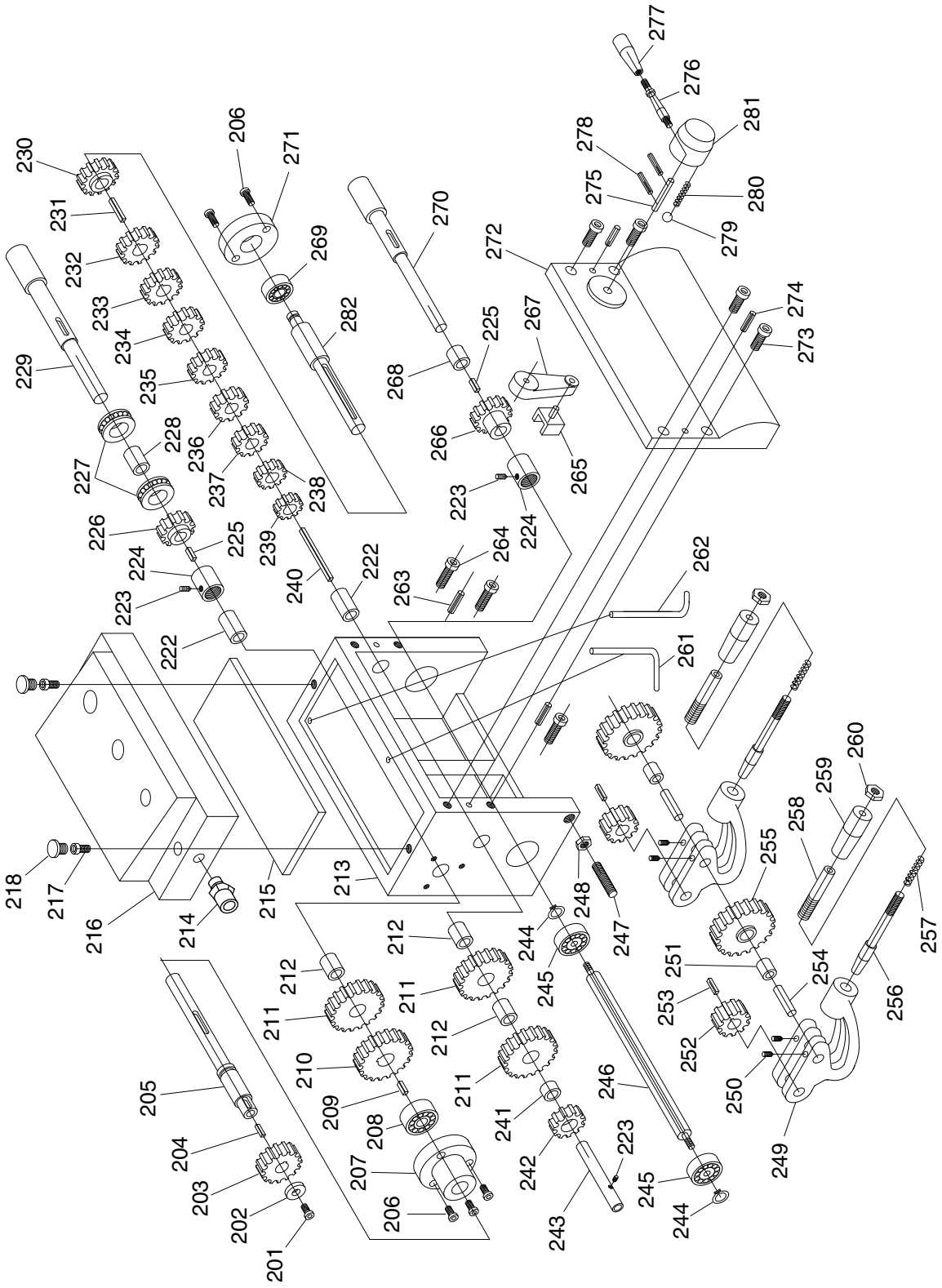
REF	PART #	DESCRIPTION
86	P9249086	HINGE
87	PRP49M	ROLL PIN 5 X 25
88	P9249088	PLUG
89	P9249089	PLUG BASE
90	P9249090	HEADSTOCK CASTING
91	PSB84M	CAP SCREW M10-1.5 X 35
92	PSB72M	CAP SCREW M10-1.5 X 30
93	PSB13M	CAP SCREW M8-1.25 X 30
94	P9249094	SIGHT GLASS
95	P7211	BEARING D-7211
96	P9249096	SPINDLE
97	P9249097	MOTOR MOUNT
98	PSB13M	CAP SCREW M8-1.25 X 30
99	P9249099	MOTOR BASE PLATE
100	PN09M	HEX NUT M12-1.75
101	PW06M	FLAT WASHER 12MM
102	PB43M	HEX BOLT M12-1.75 X 75
103	PSB14M	CAP SCREW M8-1.25 X 20
104	P9249104	SPINDLE FRONT COVER
105	P9249105	PAPER WASHER 10MM
106	P9249106	KEY 8 X 14
107	PK144M	KEY 6 X 6 X 16
108	P9249108	BACK GEAR BUSHING
109	P9249109	BACK GEAR SHAFT
110	P9249110	BACK GEAR 24/58T
111	P9249111	BACK GEAR BRACKET
112	P9249112	BACK GEAR MOUNT
113	PSB04M	CAP SCREW M6-1 X 10
114	P9249114	LOCKING PIN
115	P9249115	COMPRESSION SPRING .8 X 5 X 1.5
116	P9249116	HANDLE
117	P9249117	KNOB
118	PN01M	HEX NUT M6-1
119	P9249119	FIGURED FLAT NUT M8-1.25
120	PRP02M	ROLL PIN 3 X 16
121	P9249121	HELICAL GEAR
122	P9249122	COMPRESSION SPRING 1 X 5 X 1.5
123	P9249123	LOCKING PIN
124	P9249124	SPINDLE PULLEY
125	PSS01M	SET SCREW M6-1 X 10

Headstock Parts List

REF	PART #	DESCRIPTION
126	P9249126	BUSHING
127	PK107M	KEY 8 X 8 X 20
128	P9249128	HELICAL GEAR 39T
129	PSS16M	SET SCREW M8-1.25 X 10
130	P9249130	COLLAR
131	P30210	TAPERED ROLLER BEARING 30210
132	P9249132	BUSHING
133	P9249133	SPINDLE BACK COVER
134	PSB11M	CAP SCREW M8-1.25 X 16
135	P9249135	SPUR GEAR 40T
136	P9249136	SPANNER NUT M45 X 1.5
137	PSS04M	SET SCREW M6-1 X 12
138	P9249138	SPUR GEAR 30T
139	P9249139	BUSHING
140	P9249140	AXLE
141	P9249141	SPUR GEAR 25T
142	P9249142	SPUR GEAR 50T
143	P9249143	GEAR 40T
144	PW14M	FLAT WASHER 15MM

REF	PART #	DESCRIPTION
145	PN09M	HEX NUT M12-1.75
146	P9249146	BRACKET
147	P9249147	SPECIAL SCREW M5-.8 X 5
148	P9249148	LOCKING PIN
149	PSB01M	CAP SCREW M6-1 X 16
150	P9249150	BEARING SEAT
151	P9249151	BRACKET
152	PRP03M	ROLL PIN 5 X 20
153	PSB24M	CAP SCREW M5-.8 X 16
154	P6202	BALL BEARING 6202ZZ
155	P9249155	SHAFT
156	PK23M	KEY 5 X 5 X 25
157	PW01M	FLAT WASHER 8MM
158	P9249158	BUSHING
160	P9249160	3-JAW CHUCK 6"
161-1	P9249161-1	3-JAW BACKPLATE
953	P9249953	CHIP GUARD PLEXIGLASS
953-1	P9249953-1	CHIP GUARD SHAFT

Feed Rate Gearbox

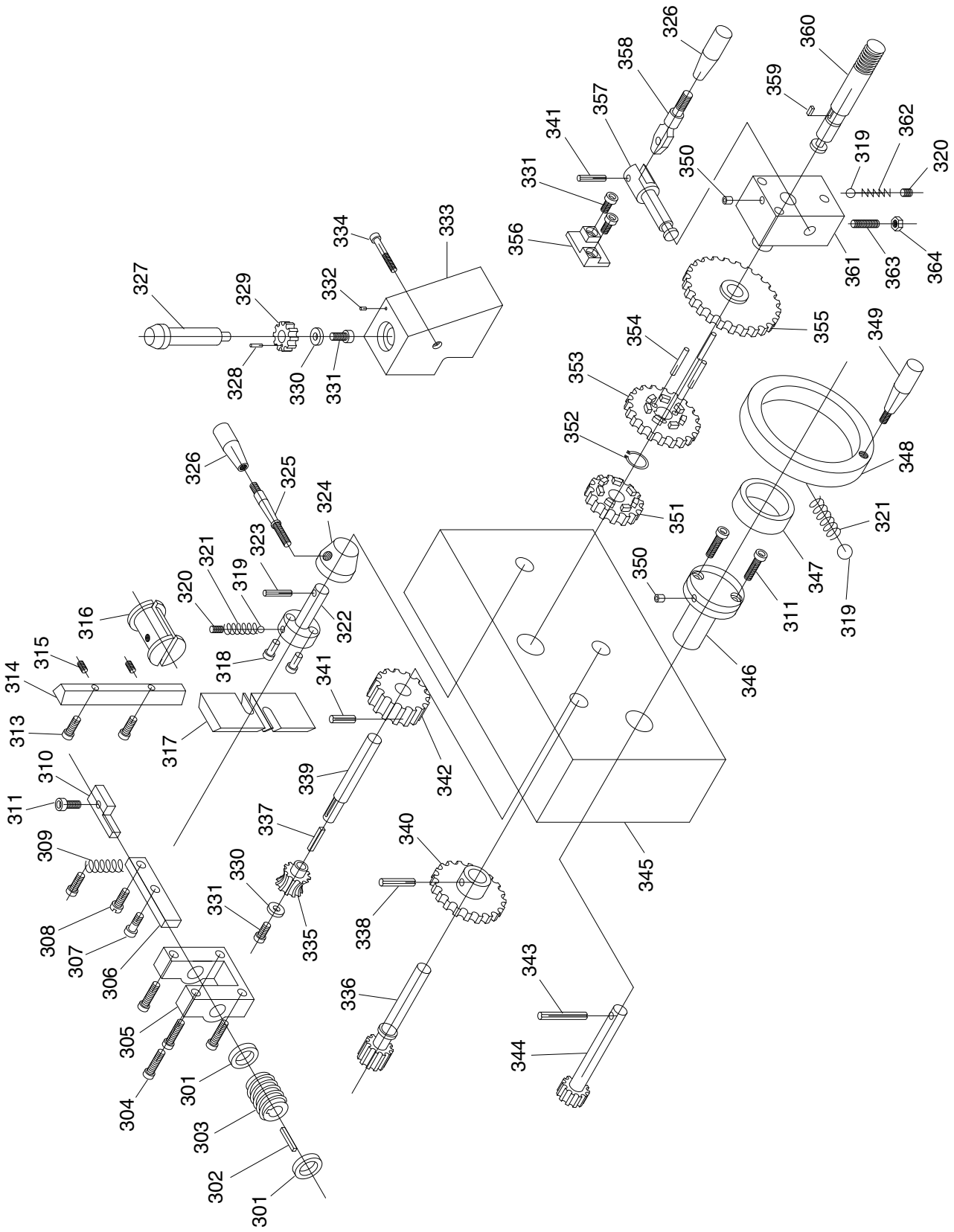


Feed Rate Gearbox Parts List

REF	PART #	DESCRIPTION
201	PSB26M	CAP SCREW M6-1 X 12
202	PW03M	FLAT WASHER 6MM
203	P9249203	GEAR
204	PK19M	KEY 5 X 5 X 14
205	P9249205	SHAFT
206	PSB04M	CAP SCREW M6-1 X 10
207	P9249207	BEARING COVER
208	P6003	BALL BEARING 6003ZZ
209	PRP24M	ROLL PIN 5 X 16
210	P9249210	DUPLEX GEAR
211	P9249211	DUPLEX GEAR 16/32T
212	P9249212	BUSHING
213	P9249213	GEARBOX CASTING
214	P9249214	STRAIN RELIEF
215	P9249215	OIL GASKET
216	P9249216	CONTROL BASE
217	P9249217	PLUG BASE
218	P9249218	PLUG
222	P9249222	BUSHING
223	PSS11M	SET SCREW M6-1 X 16
224	P9249224	LOCK COLLAR 20-2.5 X 30
225	PK144M	KEY 6 X 6 X 16
226	P9249226	GEAR 24T
227	P51104	THRUST BEARING 51104
228	P9249228	BUSHING
229	P9249229	SHAFT
230	P9249230	GEAR 24T
231	PK142M	KEY 6 X 6 X 32
232	P9249232	GEAR 28T
233	P9249233	GEAR 26T
234	P9249234	GEAR 24T
235	P9249235	GEAR 22T
236	P9249236	GEAR 20T
237	P9249237	GEAR 19T
238	P9249238	GEAR 18T
239	P9249239	GEAR 16T
240	PK120M	KEY 5 X 5 X 75
241	P9249241	BUSHING
242	P9249242	GEAR 16T
243	P9249243	SHAFT

REF	PART #	DESCRIPTION
244	PR03M	EXT RETAINING RING 12MM
245	P6201	BALL BEARING 6201
246	P9249246	SHAFT
247	PSS74M	SET SCREW M8-1.25 x 35
248	PN03M	HEX NUT M8-1.25
249	P9249249	BRACKET
250	PSS02M	SET SCREW M6-1 X 6
251	P9249251	BUSHING
252	P9249252	GEAR 16T
253	PK19M	KEY 5 X 5 X 14
254	P9249254	GEAR SHAFT 16 X 34T
255	P9249255	GEAR 36T
256	P9249256	SHAFT
257	P9249257	COMPRESSION SPRING 6 X 15
258	P9249258	THREADED SHAFT
259	P9249259	HANDLE
260	PN01M	HEX NUT M6-1
261	P9249261	OIL PIPE
262	P9249262	OIL PIPE
263	PRP03M	ROLL PIN 5 X 20
264	PSB31M	CAP SCREW M8-1.25 X 25
265	P9249265	SHIFTING FORK
266	P9249266	GEAR 24T
267	P9249267	CONNECTING ROD
268	P9249268	BUSHING
269	P6201	BALL BEARING 6201
270	P9249270	SHAFT
271	P9249271	FRONT COVER
272	P9249272	GEARBOX FRONT COVER
273	PSB01M	CAP SCREW M6-1 X 16
274	PRP26M	ROLL PIN 5 X 26
275	P9249275	SHAFT
276	P9249276	LEVER M10-1.5 X 50
277	P9249277	HANDLE
278	PRP28M	ROLL PIN 5 X 40
279	P9249279	STEEL BALL 6MM
280	P9249280	COMPRESSION SPRING 1 X 4.5 X 16-2
281	P9249281	HANDLE HUB
282	P9249282	SHAFT

Apron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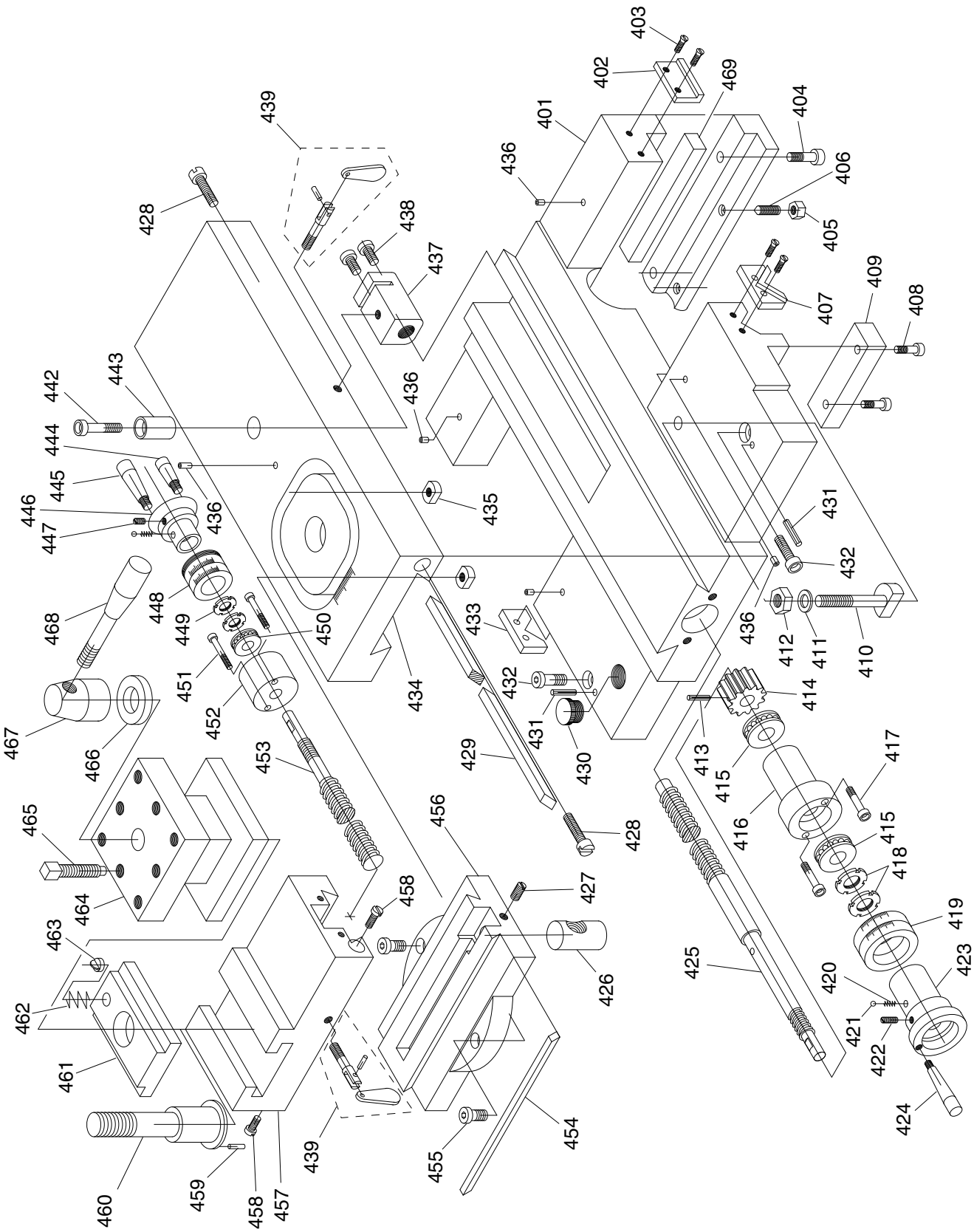
Apron Parts List

REF	PART #	DESCRIPTION
301	P9249301	COLLAR 25MM
302	PK126M	KEY 5 X 5 X 32
303	P9249303	WORM GEAR
304	PSB06M	CAP SCREW M6-1 X 25
305	P9249305	BRACKET
306	P9249306	SLIDE BAR
307	PSB68M	CAP SCREW M6-1 X 8
308	PS74M	PHLP HD SCR M4-.7 X 14
309	P9249309	COMPRESSION SPRING .8 X 5 X 1.5
310	P9249310	BRACKET
311	PSB01M	CAP SCREW M6-1 X 16
313	PSB24M	CAP SCREW M5-.8 X 16
314	P9249314	GUIDE PLATE
315	PSS04M	SET SCREW M6-1 X 12
316	P9249316	HALF NUT M25
317	P9249317	HALF NUT BRACKET
318	P9249318	SPECIAL PIN
319	P9249279	STEEL BALL 6MM
320	PSS20M	SET SCREW M8-1.25 X 8
321	P9249321	COMPRESSION SPRING .8 X 10 X 1.5
322	P9249322	HALF NUT ROD
323	PRP28M	ROLL PIN 5 X 40
324	P9249324	HANDLE HUB
325	P9249325	LEVER M12-1.75 X 50
326	P9249326	HANDLE
327	P9249327	THREAD DIAL
328	PRP61M	ROLL PIN 3 X 12
329	P9249329	INDICATOR GEAR
330	PW03M	FLAT WASHER 6MM
331	PSB26M	CAP SCREW M6-1 X 12
332	P9249332	RIVET 2.5 X 5
333	P9249333	THREAD DIAL HOUSING

REF	PART #	DESCRIPTION
334	PSB30M	CAP SCREW M6-1 X 45
335	P9249335	WORM GEAR
336	P9249336	GEAR SHAFT 16 X 116T
337	PK48M	KEY 4 X 4 X 20
338	PRP05M	ROLL PIN 5 X 30
339	P9249339	SHAFT
340	P9249340	SPUR GEAR
341	PRP49M	ROLL PIN 5 X 25
342	P9249342	TRANSMISSION GEAR
343	PRP38M	ROLL PIN 5 X 60
344	P9249344	HANDWHEEL GEAR
345	P9249345	APRON CASTING
346	P9249346	HANDWHEEL SEAT
347	P9249347	GRADUATED COLLAR
348	P9249348	HANDWHEEL
349	P9249349	HANDLE M8-1.25 X 63
350	P9249002	BALL OILER
351	P9249351	CLUTCH GEAR
352	PR06M	EXT RETAINING RING 16MM
353	P9249353	CLUTCH GEAR
354	PRP08M	ROLL PIN 6 X 30
355	P9249355	CLUTCH GEAR
356	P9249356	SHIFTING BRACKET
357	P9249357	CHANGE ROD
358	P9249358	CHANGE LEVER
359	PK29M	KEY 4 X 4 X 8
360	P9249360	CHANGE SHAFT
361	P9249361	CHANGE LEVER SEAT
362	P9249362	COMPRESSION SPRING 1 X 5 X 1.5
363	PSS74M	SET SCREW M8-1.25 X 35
364	PN03M	HEX NUT M8-1.25

Carriage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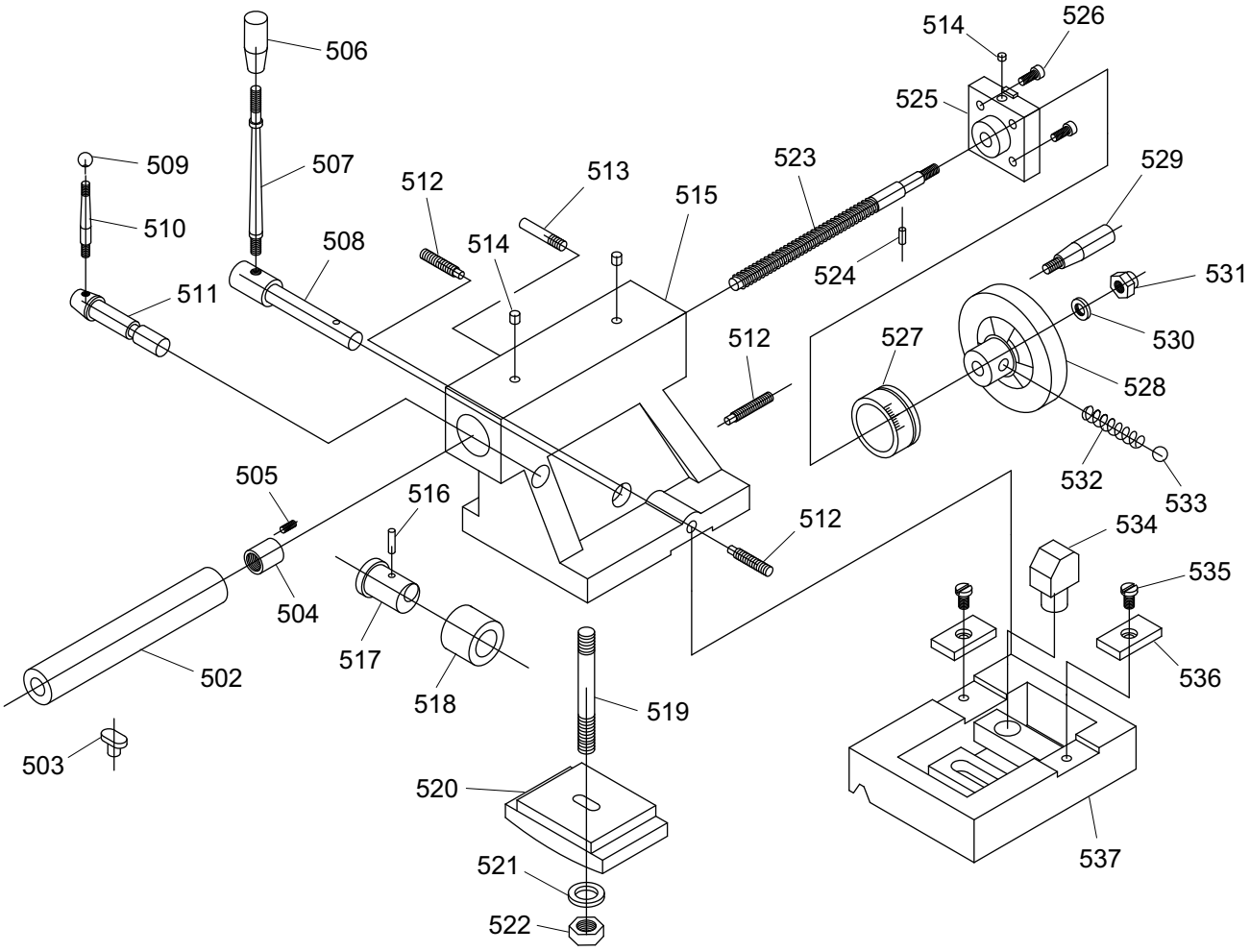
Carriage Parts List

REF	PART #	DESCRIPTION
401	P9249401	SADDLE
402	P9249402	WIPER
403	PS08M	PHLP HD SCR M5-.8 X 12
404	PSB31M	CAP SCREW M8-1.25 X 25
405	PN03M	HEX NUT M8-1.25
406	PSS21M	SET SCREW M8-1.25 X 25
407	P9249407	WIPER
408	PSB01M	CAP SCREW M6-1 X 16
409	P9249409	SLIDE BLOCK
410	P9249410	SADDLE LOCK BOLT M10-1.5 X 100
411	PW04M	FLAT WASHER 10MM
412	PN02M	HEX NUT M10-1.5
413	PRP03M	ROLL PIN 5 X 20
414	P9249414	GEAR 12T
415	P8101	THRUST BEARING 8101
416	P9249416	LEADSCREW SEAT M35
417	PSB30M	CAP SCREW M6-1 X 45
418	PN09M	SPANNER NUT M12-1.75
419	P9249419	GRADUATED COLLAR
420	P9249420	COMPRESSION SPRING .5 X 5 X 1.5
421	P9249279	STEEL BALL 6MM
422	PSS11M	SET SCREW M6-1 X 16
423	P9249423	HANDWHEEL
424	P9249424	HANDLE
425	P9249425	SADDLE LEADSCREW M15
426	P9249426	LEADSCREW NUT M15
427	PSS04M	SET SCREW M6-1 X 12
428	P9249428	GIB SCREW M6-1 X 20
429	P9249429	CROSS SLIDE GIB
430	P9249430	PLUG
431	PRP45M	ROLL PIN 5 X 32
432	PSB13M	CAP SCREW M8-1.25 X 30
433	P9249433	WIPER
434	P9249434	CROSS SLIDE

REF	PART #	DESCRIPTION
435	P9249435	SPECIAL NUT
436	P9249002	BALL OILER
437	P9249437	LEADSCREW NUT M15
438	PSB39M	CAP SCREW M4-.7 X 20
439	P9249439	SLIDE LOCK ASSY
442	PSB02M	CAP SCREW M6-1 X 20
443	P9249443	BUSHING
444	P9249444	HANDLE
445	P9249445	HANDLE
446	P9249446	HANDWHEEL
447	PSS02M	SET SCREW M6-1 X 6
448	P9249448	GRADUATED COLLAR
449	P9249449	SPANNER NUT M10-1
450	P8100	THRUST BEARING 8100
451	PSB21M	CAP SCREW M4-.7 X 30
452	P9249452	BEARING SEAT
453	P9249453	CROSS SLIDE LEADSCREW M15
454	P9249454	COMPOUND SLIDE GIB
455	PSB76M	CAP SCREW M8-1.25 X 18
456	P9249456	COMPOUND SLIDE BASE
457	P9249457	COMPOUND SLIDE
458	P9249458	GIB SCREW M5-.8 X 15
459	PRP78M	ROLL PIN 4 X 10
460	P9249460	TOOL POST SHAFT M20-2.5 X 100
461	P9249461	T-SLIDE 3 X 6
462	P9249462	COMPRESSION SPRING .8 X 5 X 1.5
463	P9249463	LOCK PIN
464	P9249464	4-WAY TOOL POST
465	P9249465	TOOL POST SCREW M6-1 X 4
466	PW23M	FLAT WASHER 30MM
467	P9249467	HANDLE HUB
468	P9249468	HANDLE
469	P9249469	SADDLE GIB

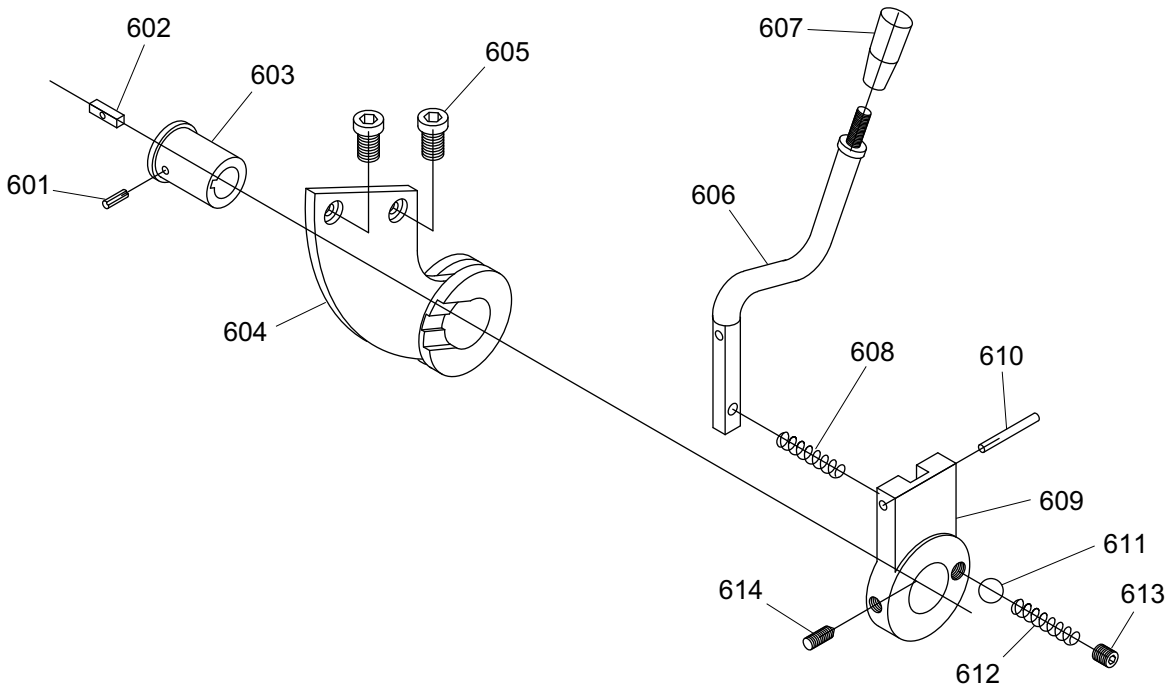
Tailstock



REF	PART #	DESCRIPTION
502	P9249502	TAILSTOCK QUILL
503	P9249503	T-KEY
504	P9249504	LEADSCREW NUT M15
505	PSS01M	SET SCREW M6-1 X 10
506	P9249506	KNOB M10-1.5 X 50
507	P9249507	LEVER
508	P9249508	CLAMPING SHAFT
509	P9249509	KNOB M6-1 X 20
510	P9249510	LEVER
511	P9249511	CLAMPING SHAFT
512	PSS84M	SET SCREW M10-1.5 X 40
513	P9249513	SPECIAL SCREW
514	P9249514	BALL OILER
515	P9249515	TAILSTOCK CASTING
516	PRP49M	ROLL PIN 5 X 25
517	P9249517	ECCENTRIC AXLE
518	P9249518	BUSHING
519	P9249519	CLAMPING BOLT M12-1.75 X 100

REF	PART #	DESCRIPTION
520	P9249520	CLAMPING BLOCK
521	PW06M	FLAT WASHER 12MM
522	PN09M	HEX NUT M12-1.75
523	P9249523	TAILSTOCK LEADSCREW
524	PRP35M	ROLL PIN 5 X 10
525	P9249525	LEADSCREW BRACKET
526	PSB01M	CAP SCREW M6-1 X 16
527	P9249527	GRADUATED COLLAR
528	P9249528	QUILL HANDWHEEL
529	P9249529	HANDLE M8-1.25 X 63
530	PW04M	FLAT WASHER 10MM
531	PLN05M	LOCK NUT M10-1.5
532	P9249532	COMPRESSON SPRING .8 X 10 X 1.5
533	P9249279	STEEL BALL 6MM
534	P9249534	BRACKET
535	P9249535	SPECIAL SCREW M6-1 X 12
536	P9249536	CLAMP BLOCK
537	P9249537	TAILSTOCK BASE

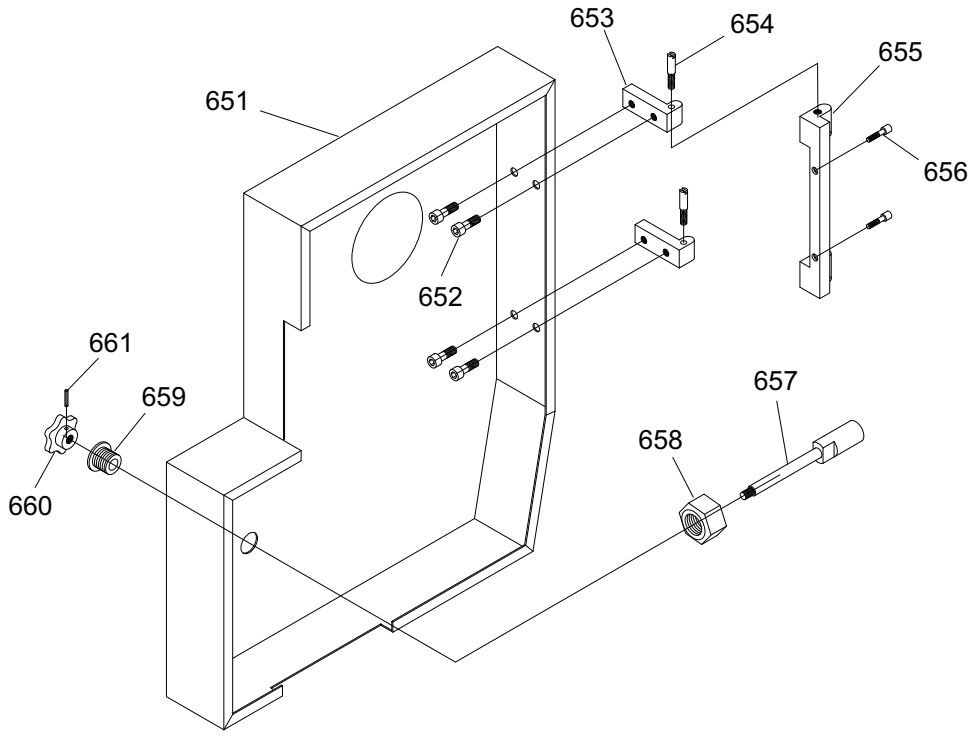
Spindle Lever



REF	PART #	DESCRIPTION
601	PRP14M	ROLL PIN 3 X 6
602	PK14M	KEY 5 X 5 X 18
603	P9249603	BUSHING
604	P9249604	LEVER BRACKET
605	PSB26M	CAP SCREW M6-1 X 12
606	P9249606	HANDLE
607	P9249607	KNOB M10 X 50

REF	PART #	DESCRIPTION
608	P9249608	COMPRESSION SPRING 1 X 6 X 22
609	P9249609	COVER
610	PRP45M	ROLL PIN 5 X 32
611	P9249279	STEEL BALL 6MM
612	P9249612	COMPRESSION SPRING 1 X 6 X 9
613	PSS16M	SET SCREW M8-1.25 X 10
614	P9249614	TAPERED SET SCREW M8-1.25 X 12

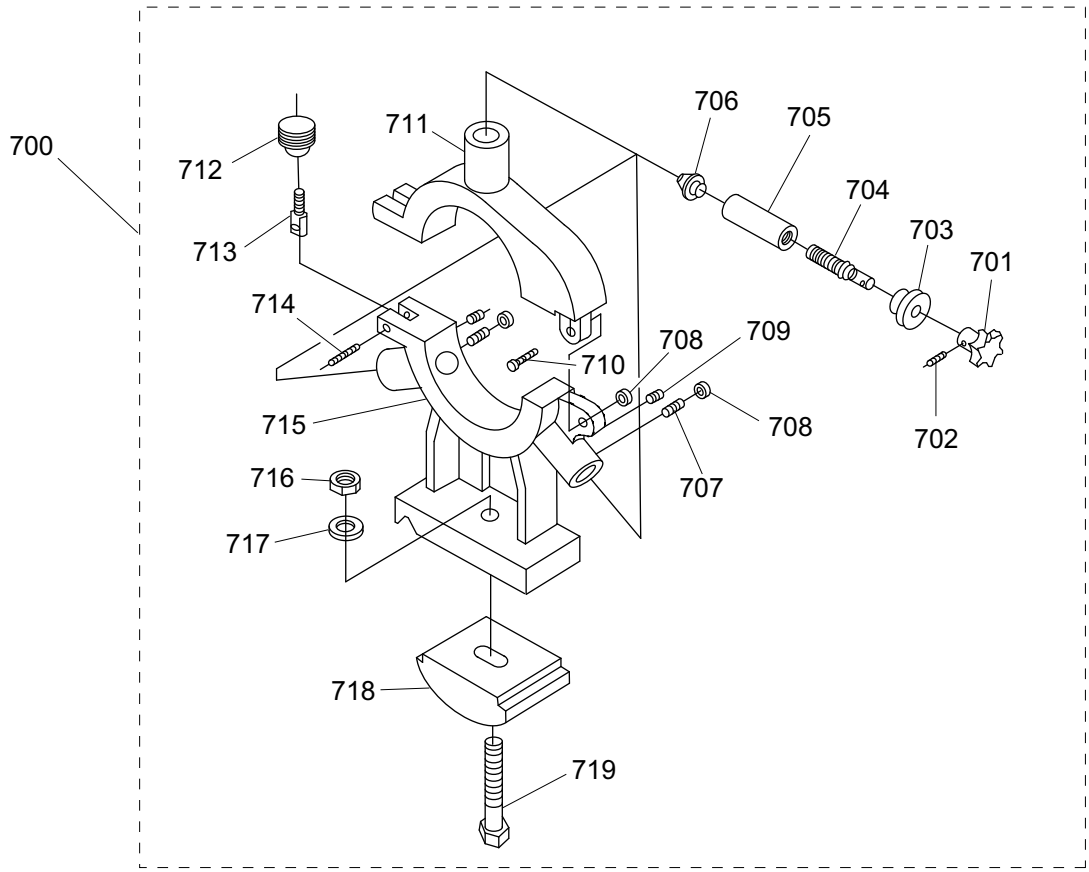
Change Gear Cover



REF	PART #	DESCRIPTION
651	PSB26M	CHANGE GEAR COVER
652	PSB01M	CAP SCREW M6-1 X 16
653	P9249653	HINGE
654	P9249654	HINGE SCREW M6 X 10
655	P9249655	BRACKET
656	PSB01M	CAP SCREW M6-1 X 16

REF	PART #	DESCRIPTION
657	P9249657	LOCKING ROD
658	PN13M	HEX NUT M16-2
659	P9249659	THREADED SLEEVE
660	P9249660	KNOB M8 X 32
661	PRP02M	ROLL PIN 3 X 16

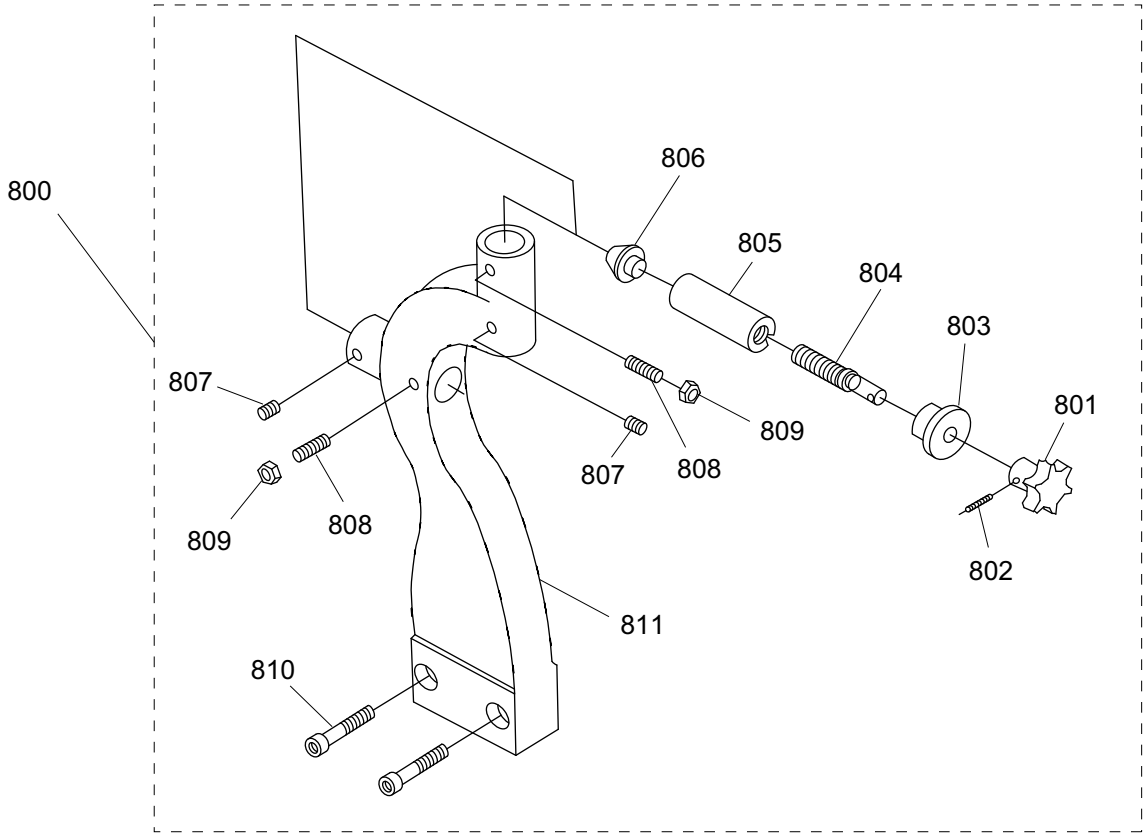
Steady Rest



REF	PART #	DESCRIPTION
700	P9249700	COMPLETE STEADY REST
701	P9249701	STAR HANDLE M8-1.25 X 30
702	PRP02M	ROLL PIN 3 X 16
703	P9249703	COLLAR
704	P9249704	ADJUSTING SCREW M8-1.25 X 40
705	P9249705	BUSHING
706	P9249706	CLAMPING BLOCK
707	PSS11M	SET SCREW M6-1 X 16
708	PN01M	HEX NUT M6-1
709	PSS03M	SET SCREW M6-1 X 8

REF	PART #	DESCRIPTION
710	PB10M	HEX BOLT M6-1 X 25
711	P9249711	STEADY REST COVER
712	P9249712	KNOB
713	P9249713	LEVER
714	PRP05M	ROLL PIN 5 X 30
715	P9249715	STEADY REST BASE
716	PN09M	HEX NUT M12-1.75
717	PW06M	FLAT WASHER 12MM
718	P9249718	CLAMP PLATE
719	PB140M	HEX BOLT M12-1.75 X 70

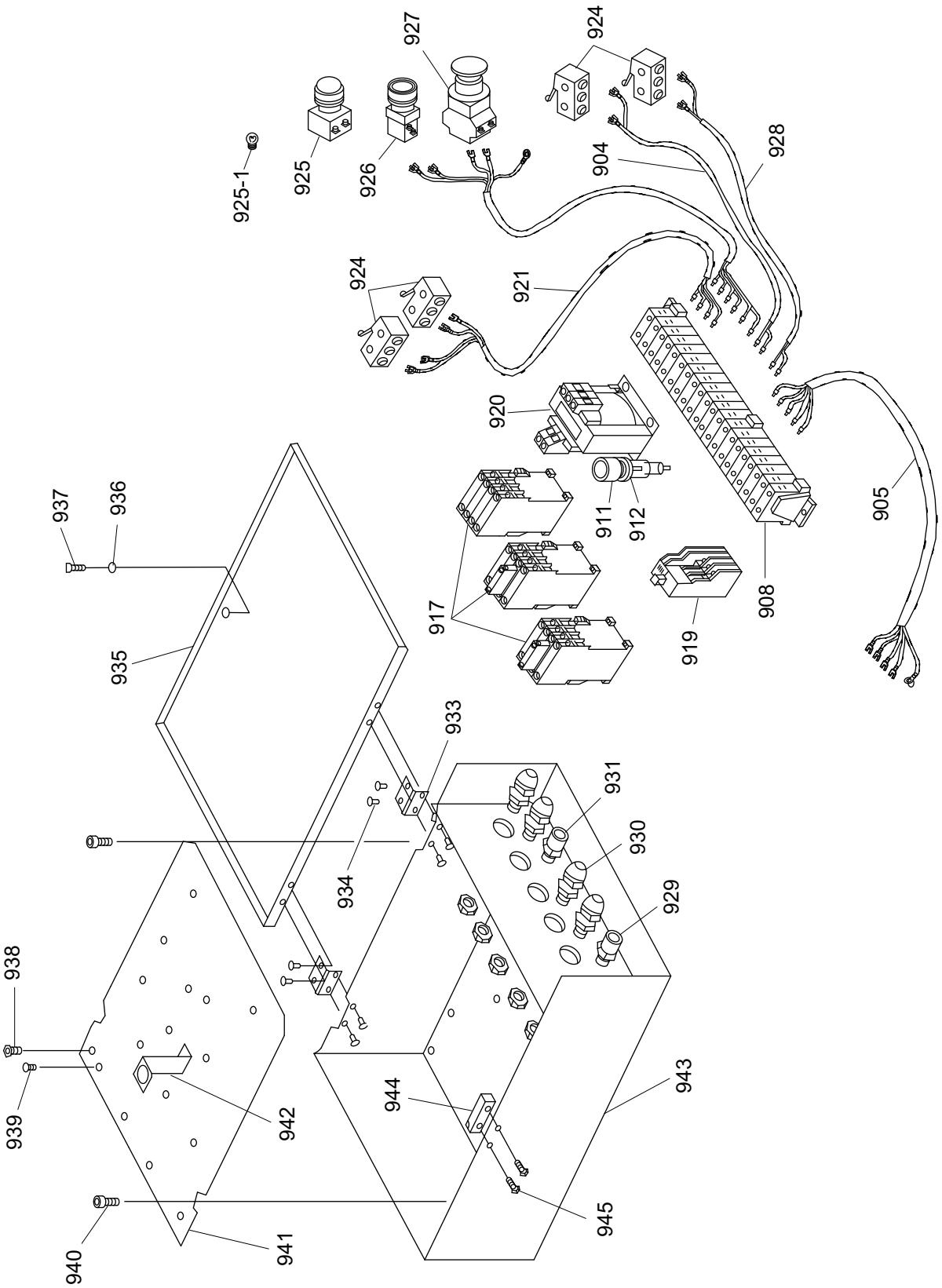
Follow Rest



REF	PART #	DESCRIPTION
800	P9249800	COMPLETE FOLLOW REST
801	P9249801	STAR HANDLE M8-1.25 X 30
802	PRP02M	ROLL PIN 3 X 16
803	P9249803	COLLAR
804	P9249704	ADJUSTING SCREW M8 X 40
805	P9249805	BUSHING

REF	PART #	DESCRIPTION
806	P9249806	CLAMPING BLOCK
807	PSS03M	SET SCREW M6-1 X 8
808	PSS11M	SET SCREW M6-1 X 16
809	PN01M	HEX NUT M6-1
810	PSB40M	CAP SCREW M8-1.25 X 35
811	P9249811	FOLLOW REST BASE

Electrical Cabinet

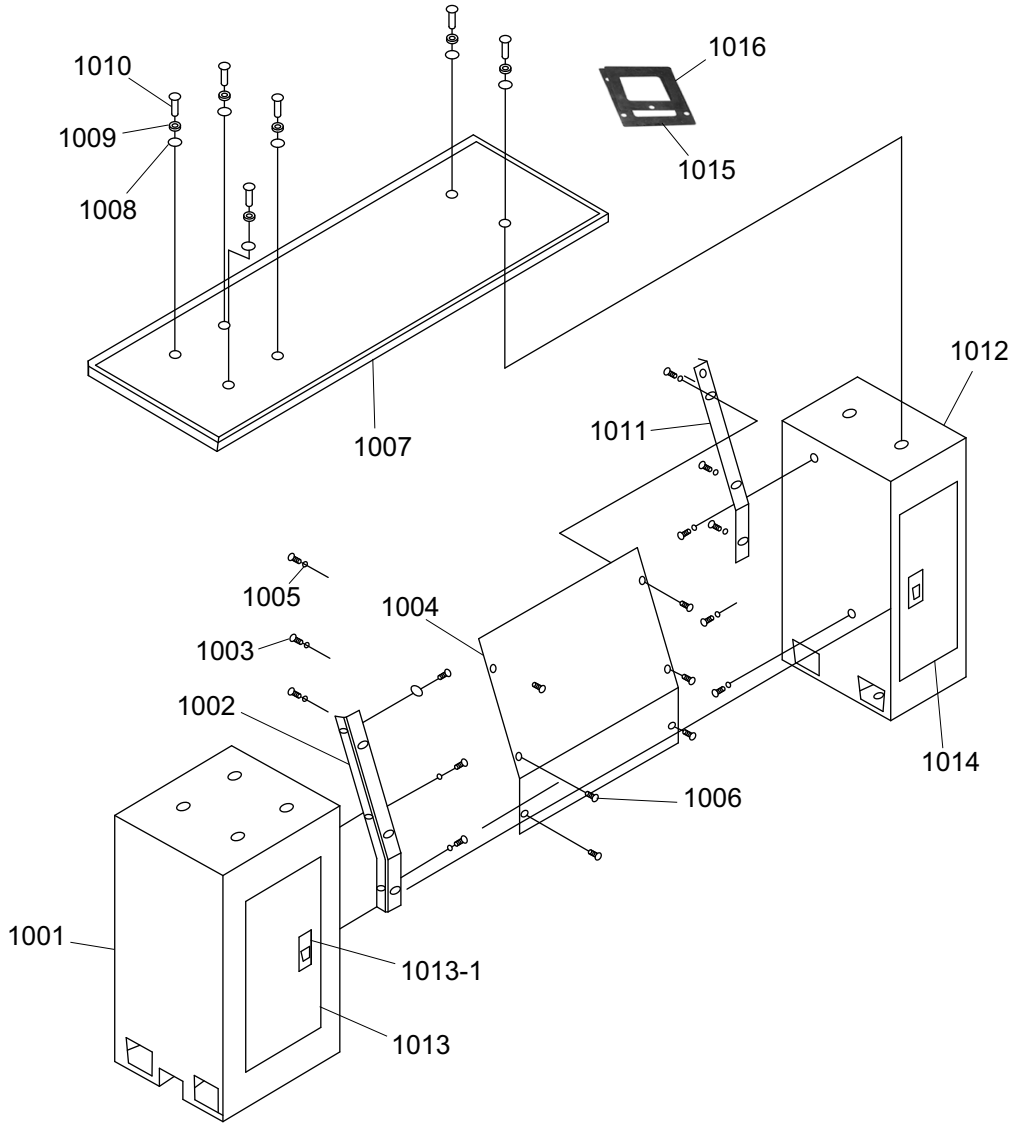


Electrical Cabinet Parts List

REF	PART #	DESCRIPTION
904	P9249904	CHIP GUARD SAFETY SWITCH CABLE
905	P9249905	MOTOR CABLE
908	P9249908	TERMINAL BLOCK 19T
911	P9249911	FUSE HOLDER
912	P9249912	FUSE 2A
917	P9249917	CONTACTOR JUCHE CJX2-1201 220V
919	P9249919	OL RELAY JUCHE JR28-25 1/10A
920	P9249920	TRANSFORMER JUCHE JBK5-63 24V
921	P9249921	SPINDLE DIRECTION CABLE
924	P9249924	MICRO SWITCH
925	P9249925	POWER LAMP
925-1	P9249925-1	POWER LAMP BULB
926	P9249926	JOG BUTTON
927	P9249927	EMERGENCY STOP SWITCH
928	P9249928	SAFETY SWITCH CABLE
929	P9249929	STRAIN RELIEF 5/8"

REF	PART #	DESCRIPTION
930	P9249930	STRAIN RELIEF 3/4"
931	P9249931	STRAIN RELIEF 7/8"
933	P9249933	HINGE
934	P9249934	RIVET 3 X 8
935	P9249935	DOOR
936	PN04M	HEX NUT M4-.7
937	PS18M	PHLP HD SCR M4-.7 X 25
938	PS07M	PHLP HD SCR M4-.7 X 8
939	PS02M	PHLP HD SCR M4-.7 X 12
940	PSB58M	CAP SCREW M8-1.25 X 12
941	P9249941	ELECTRICAL PANEL
942	P9249942	FUSE SUPPORT
943	P9249943	ELECTRICAL BOX
944	P9249944	LATCH BLOCK
945	PS07M	PHLP HD SCR M4-.7 X 8

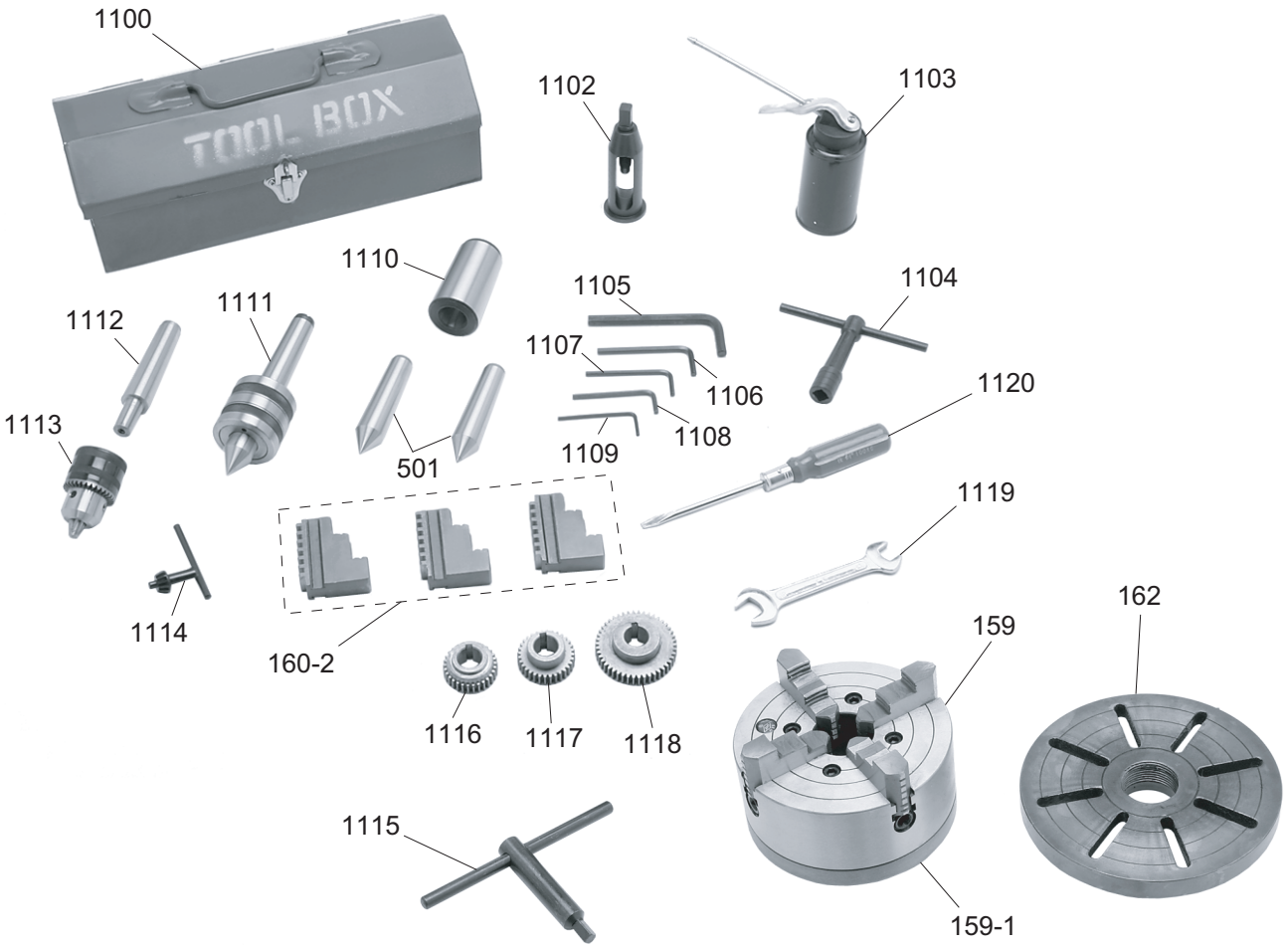
Cabinet Stand



REF	PART #	DESCRIPTION
1001	P92491001	CABINET LEFT
1002	P92491002	CENTER PANEL BRACKET LEFT
1003	PS68M	PHLP HD SCR M6-1 X 10
1004	P92491004	CENTER PANEL
1005	PW03M	FLAT WASHER 6MM
1006	PS68M	PHLP HD SCR M6-1 X 10
1007	P92491007	CHIP PAN
1008	PW06M	FLAT WASHER 12MM
1009	PLW05M	LOCK WASHER 12MM

REF	PART #	DESCRIPTION
1010	PB33M	HEX BOLT M12-1.75 X 50
1011	P92491011	CENTER PANEL BRACKET RIGHT
1012	P92491012	CABINET RIGHT
1013	P92491013	CABINET DOOR LEFT
1013-1	P92491013-1	DOOR LATCH
1014	P92491014	CABINET DOOR RIGHT
1015	P92491015	CHIP PAN RUBBER GASKET LEFT
1016	P92491016	CHIP PAN RUBBER GASKET RIGHT

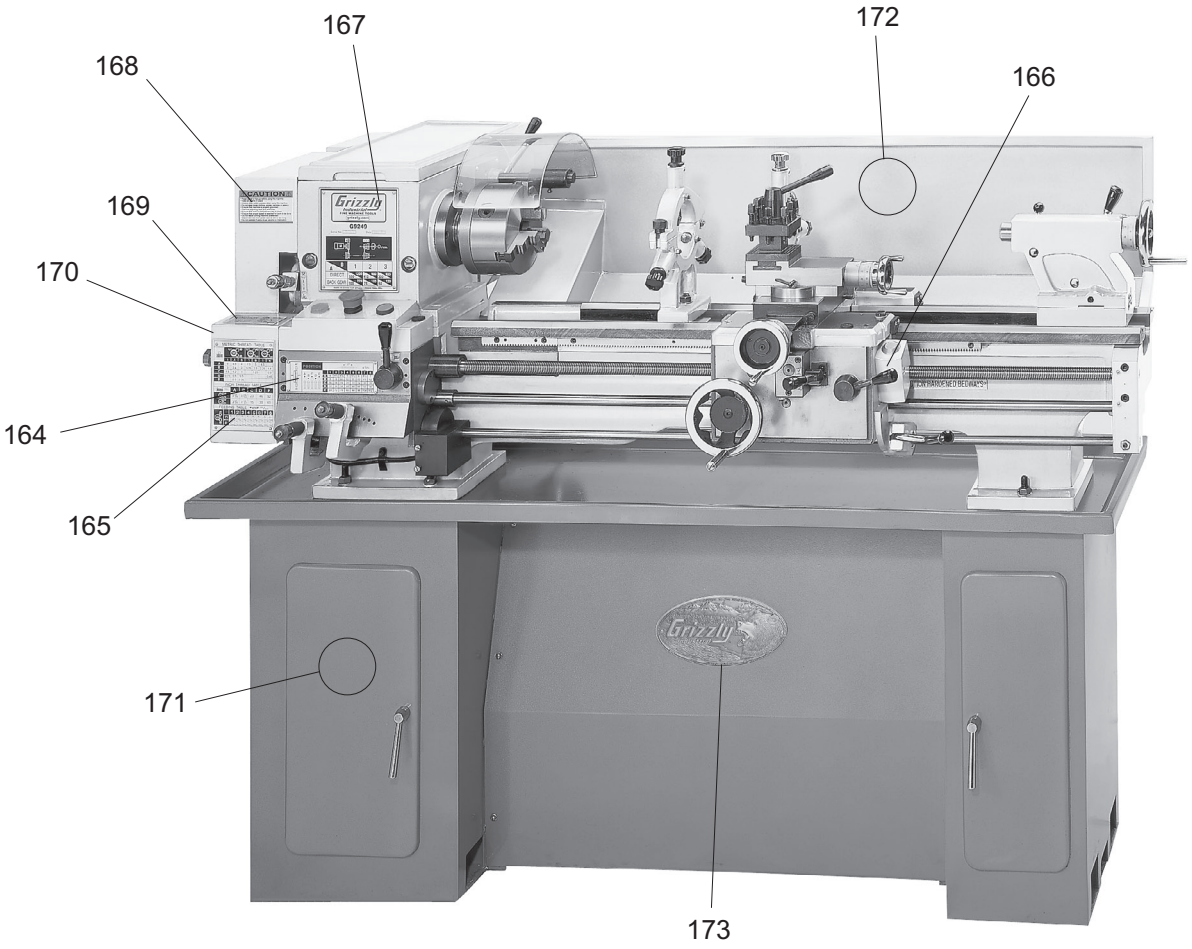
Accessories



REF	PART #	DESCRIPTION
159	P9249159	4-JAW CHUCK 8"
159-1	P9249159-1	4-JAW CHUCK BACKPLATE
160-2	P9249160-2	3-JAW CHUCK OUTSIDE JAW SET
162	P9249162	FACEPLATE 12"
501	P9249501	DEAD CENTER MT#3
1100	P92491100	TOOL BOX
1102	P92491102	TOOL POST AMERICAN ROCKER TYPE
1103	P92491103	OIL CAN
1104	P92491104	4-WAY TOOL POST KEY
1105	PAW08M	HEX WRENCH 8MM
1106	PAW06M	HEX WRENCH 6MM
1107	PAW05M	HEX WRENCH 5MM
1108	PAW04M	HEX WRENCH 4MM

REF	PART #	DESCRIPTION
1109	PAW03M	HEX WRENCH 3MM
1110	P92491110	SPINDLE SLEEVE MT#3-MT#5
1111	P92491111	LIVE CENTER MT#3
1112	P92491112	DRILL CHUCK ARBOR MT#3-B16
1113	P92491113	DRILL CHUCK B16
1114	P92491114	DRILL CHUCK KEY
1115	P92491115	CHUCK KEY
1116	P92491116	CHANGE GEAR 30T
1117	P92491117	CHANGE GEAR 32T
1118	P92491118	CHANGE GEAR 46T
1119	P92491119	OPEN END WRENCH 13/16MM
1120	P92491120	STANDARD SCREWDRIVER #2

Label Placement



REF	PART #	DESCRIPTION
164	P9249164	GEARBOX CHART LABEL
165	P9249165	THREADING CHART LABEL
166	P9249166	THREADING DIAL CHART LABEL
167	P9249167	SPINDLE SPEED CHART LABEL
168	P9249168	GENERAL WARNING LABEL

REF	PART #	DESCRIPTION
169	P9249169	CHANGE GEAR LABEL
170	P9249170	MACHINE ID LABEL
171	PPAINT-1	GRIZZLY GREEN TOUCH UP PAINT
172	PPAINT-11	GREY PUTTY TOUCH UP PAINT
173	G8588	GRIZZLY NAMEPLATE 9-1/2 X 4-1/5

⚠WARNING

Safety labels warn about machine hazards and ways to prevent injury. The owner of this machine MUST maintain the original location and readability of the labels on the machine. If any label is removed or becomes unreadable, REPLACE that label before using the machine again. Contact Grizzly at (800) 523-4777 or www.grizzly.com to order new labels.

Grizzly Industrial, Inc. WARRANTY CARD

Name _____

Street _____

City _____ State _____ Zip _____

Phone # _____ Email _____ Invoice # _____

Model # _____ Order # _____ Serial # _____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. ***Of course, all information is strictly confidential.***

1. How did you learn about us?

____ Advertisement ____ Friend ____ Catalog
____ Card Deck ____ Website ____ Other:

2. Which of the following magazines do you subscribe to?

____ Cabinet Maker
____ Family Handyman
____ Hand Loader
____ Handy
____ Home Shop Machinist
____ Journal of Light Cont.
____ Live Steam
____ Model Airplane News
____ Modeltec
____ Old House Journal
____ Popular Mechanics
____ Popular Science
____ Popular Woodworking
____ Practical Homeowner
____ Precision Shooter
____ Projects in Metal
____ RC Modeler
____ Rifle
____ Shop Notes
____ Shotgun News
____ Today's Homeowner
____ Wood
____ Wooden Boat
____ Woodshop News
____ Woodsmith
____ Woodwork
____ Woodworker West
____ Woodworker's Journal
____ Other:

3. What is your annual household income?

____ $20,000-$29,000 ____ $30,000-$39,000 ____ $40,000-$49,000
____ $50,000-$59,000 ____ $60,000-$69,000 ____ $70,000+

4. What is your age group?

____ 20-29 ____ 30-39 ____ 40-49
____ 50-59 ____ 60-69 ____ 70+

5. How long have you been a woodworker/metalworker?

____ 0-2 Years ____ 2-8 Years ____ 8-20 Years ____ 20+ Years

6. How many of your machines or tools are Grizzly?

____ 0-2 ____ 3-5 ____ 6-9 ____ 10+

7. Do you think your machine represents a good value? _____ Yes _____ No

8. Would you recommend Grizzly Industrial to a friend? _____ Yes _____ No

9. Would you allow us to use your name as a reference for Grizzly customers in your area?
Note: *We never use names more than 3 times.* _____ Yes _____ No

10. Comments: _____

_____

_____

_____

CUT ALONG DOTTED LINE

FOLD ALONG DOTTED LINE

Place
Stamp
Here

GRIZZLY INDUSTRIAL, INC.
P.O. BOX 2069
BELLINGHAM, WA 98227-2069

FOLD ALONG DOTTED LINE

Send a Grizzly Catalog to a friend:

Name_____

Street_____

City_____State_____Zip_____

TAPE ALONG EDGES--PLEASE DO NOT STAPLE

WARRANTY AND RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number,'' which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

grizzly.com
TOOL WEBSITE

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